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SOME EFFECTS OF DISTURBANCE OF PHYSIOLOGY OF MOVEMENTS OF GASTRO-INTESTINAL TUBE.[1]

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I ASK your permission to change the title of the paper I propose to present this evening, from "Some Enlargements of the Abdomen from the Medical Aspect" to the title given above. This will enable me to deal with the physiology of intestinal movement in a general way and to show the dependence of many abdominal conditions, including enlargement, upon disturbances of these movements.

I begin with a brief review of the anatomy and physiology of the gastro-intestinal tube. The intestinal tube is a hollow muscular tube with its muscles arranged in two layers, an outer longitudinal and an inner circular. Beneath the longitudinal layer and between it and the circular layer is to be found a nerve plexus or network known as Auerbach's plexus, composed of ganglion cells and nerve fibres. Beneath the circular coat there is another nerve network known as Meissner's plexus. Nerve fibres pass between the two plexuses and to the muscles and the mucous membrane.

We have no definite knowledge as to the function of Meissner's plexus, but that Auerbach's plexus is definitely concerned with the movements of both muscular coats seems certain. Keith[(1)] states that Auerbach's plexus or an extension of it which he names Auerbach's tissue, is comparable to the nodal tissue found in the heart and that this nodal tissue is highly developed and abundant in the region of the pylorus and the terminal ileum and the descending colon in which normally there is a condition of hypertonus.

This local nervous network (Auerbach's plexus) is connected with the central nervous system through the vagus and pelvic nerves and the splanchnic sympathetic fibres. The vagus and pelvic nerves are the great motor nerves to the gastro-intestinal tract. Their branches end by forming synapses with the ganglion cells of Auerbach's plexus found in the intestinal wall. Stimulation of the vagus has the effect of producing an initial inhibition of the whole small intestine, followed by increased irritability and increased contractions. On the other hand stimulation of the splanchnic causes complete relaxation of both coats of the small gut with cessation of movements. A similar effect is produced in the large intestine by stimulation of the pelvic nerves and the inferior mesenteric nerves (sympathetic).

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on November 27, 1924.

Sherrington[2] has shown that the non-striated muscles of hollow viscera, like striated muscles, exhibit a condition of tonus. The muscle fibres show lengthening and shortening reactions by virtue of which they maintain a more or less constant tension on the contents of the viscera and allow the viscera to assume varying postures according to the amount of their contents. This condition of tonus Sherrington speaks of as postural or plastic tonus.

It is owing to the postural or plastic tonus that we have the varying shape of the stomach according to its contents and the fact that despite differences in the amount of content, the tension on the contents, intra-gastric tension, is maintained at much the same level. We must look upon the stomach as being full when it contains three hundred, six hundred or twelve hundred cubic centimetres and the tension, provided the increase has not been made too rapidly, varies very little. This maintenance of a fairly constant tension with varying postures dependent upon varying contents, is illustrated by the following extracts from Sherrington's paper, "Postural Activity of Muscle and Nerve":

> Four hundred cubic centimetres of water were put into the stomach of an etherized dog through a cannula. The intra-gastric pressure at once rose from 4 c.c. to 6 c.c.; 20 minutes later it had fallen to 4 c.c. The organ had made room for the additional content and exerted on it only the same light pressure as it had done on the smaller content it had held previously. Its muscular coat had exchanged its previous 100 c.c. posture for a 500 c.c. posture practically without change of tension.
>
> The bladder of a dog was observed even at rapid intervals to hold very different volumes of water under one and the same pressure. It would exert a pressure of 10 cm. of water whether its contents were 10 c.c. or 90 c.c. or a pressure of 15 cm. whether it contained 50 c.c. or 150 c.c.

The intestines, too, like the stomach and the bladder, assume varying postural states according to varying degrees of postural tonus of the muscle walls.

The late and deeply lamented Professor J. I. Hunter in collaboration with his colleague Dr. N. Royle, has demonstrated definitely and conclusively that plastic or postural tonus of muscle, both striped and non-striped, is dependent upon sympathetic innervation.

Of the three different movements which physiologists describe, namely, (a) a pendulum swaying movement, (b) segmental rhythmic movement, (c) peristaltic movement (peristaltic rush), only the peristaltic movement will engage our attention. Every peristaltic movement consists essentially of two phases, a phase of contraction and a phase of relaxation, as Bayliss[3] and Starling[4] first definitely and completely demonstrated.

These observers found that when a mechanical stimulus in the nature of a pinch of the intestinal wall was applied to the intestine *in situ*, but freed from all central nerve control or in a segment of the excised gut, a definite movement resulted. Above the site of the stimulus a contraction of the intestinal tube occurred and at the same time below the site of the stimulus relaxation of the segment of the gut took place. To these concurrent movements they gave the name of "the law of the intestine." Now this "law of the intestine" is not confined to the intestine. It operates in the oesophagus, in the stomach, in the bladder, in the uterus, in fact in all the hollow viscera. The operation of this law as regards the intestine results in the movement onward of the intestinal contents. It can take place, as Bayliss and Starling showed, when the gut is freed from all central nerve connexions. Under such circumstances evidently it must be the result of a local reflex and the only local nerve mechanism that could subserve such a reflex, is Auerbach's plexus.

We may consider, then, that the harmonious operation of "the law of the intestine" is dependent upon the integrity of a local reflex, the myenteric reflex, as Cannon[5] calls it. But this reflex, like all other reflexes, is governed, controlled and modified by impulses reaching it from the central nervous system through vagus and pelvic and splanchnic nerves.

But we must not think that "the law of the intestine" is a phase of neuro-muscular activity peculiar to the intestinal tube or other hollow viscera. It should be looked upon as the application of a more general law, "the law of reciprocal innervation" (Sherrington).[6] This law manifests itself by concurrent contraction and relaxation or inhibition of muscle, contraction of agonists and inhibition of antagonists. When the biceps contracts there is relaxation of the triceps or, to put it into more precise physiological language, when the biceps contracts the plastic or postural tonus of the triceps is inhibited. A striking demonstration of this "law of reciprocal innervation" is given by Sherrington in the following experiment: If the third and fourth cranial nerves of one side, for example the left, have been severed, so that *rectus externus* remains the only unparalysed ocular muscle, appropriate excitation of the *cortex cerebri* produces conjugate movement of both eyes towards the opposite side, that is from left toward right, the left eye travelling, however, only so far as the median line. Inhibition of the tonus and of the active contraction of *rectus externus* can thus be elicited from the cortex.

Thus we see that this "law of the intestine" is really the "law of reciprocal innervation" applied to hollow viscera.

Now a normal stimulus for peristalsis is distension of the bowel. Bayliss and Starling found that the "law of the intestine" could be brought into operation by inserting into a segment of the bowel a bolus of cotton wool coated with vaseline. So normally, when a bolus of the intestinal contents causes a slight increase in intestinal tension, a peristaltic wave is set up resulting in the onward passage of these contents.

The taking of food into the stomach sets up peristalsis. This is especially noticed at the ileo-caecal junction where what is called a peristaltic rush (which really is nothing more than an exaggeration of the ordinary peristaltic wave) takes place. The influence of the taking of food on peri-

stalsis is seen in the cases of babies who are suffering from diarrhœa. Such babies frequently have their bowels moved while they are actually taking their food. Peristaltic waves set up in the duodenum by food passing from the stomach evoke waves in successive segments of the intestinal tube until the rectum, receiving some of the previous fæcal contents of the pelvic colon, discharges these contents under the influence of the final successive wave. Under the stress of emotion borborygmi take place, the bowels yearn, as the scriptures say. On the other hand emotion may have the opposite effect and lead to a complete arrest of all intestinal movements. Cannon[5] relates that while he was studying the movements of the intestine of a cat by X-rays, the animal which for a long time had been accustomed to the operation, suddenly became angry at the appearance of a dog to which it had always shown great antipathy. The intestinal movements came to a standstill and remained so until the dog was removed. Very soon afterwards the intestinal movements were resumed, as could be seen by X-rays.

These two stimuli, the taking of food and emotion, afford definite evidence that the local myenteric reflex is controlled and coordinated by the central nervous system acting through the vagus and splanchnic nerves.

That the sympathetic plays an important part in the operation of "the law of the intestine" is evident from the observations of Hunter[7] and Royle.[8] Their first patient on whom ramisection had been performed for hemiplegia due to gun-shot wound of the cerebral cortex, previously to operation had great difficulty even with purges in getting the bowels to act. After the operation the bowels moved freely and easily without the aid of medicine.

Further Hunter[7] has shown that the sympathetic exercises a continuously acting, regulating effect on the intestine as illustrated by the following experiment:

> Immediately following the transection of the cord there is retention of fæces. It is possible to open the peritoneal cavity of a spinal animal without the administration of an anæsthetic, although light ether anæsthesia was sometimes employed. The distal colon will be found to be inactive. That this is not due to temporary reflex inhibition, a result of the incision, is shown by the over-distension exhibited by this part of the bowel due to retention of fæces since the time of operation, *e.g.*, twenty-four hours previously. If the bowel be distended by the injection of normal saline through the anus, reflex contraction of the bowel may be elicited and the fluid extruded together with a few scybala, showing that the parasympathetic reflex is intact. Dilatation of the gut wall and contraction of the rectal sphincter when the enema is passed out replaces the temporary contraction of the wall. If the hypo-gastric nerves be now removed or the ganglionated sympathetic cords in the lumbar region be excised a marked change occurs. Immediately activity of the distal colon is resumed, the longitudinal muscle shortens and the circular fibres contract and the scybala are pushed on into a relaxed portion of gut distal to the site of contraction.

Under normal conditions peristalsis gives rise to no conscious sensations. When it is excessive, we may become aware of it. We may feel the rushing and the rumbling of intestinal contents. When, however, the "law of the intestine" is interfered with, disagreeable sensations follow. If, for example, contraction above a stimulus is not followed by relaxation then we may have greatly increased tension in what should be the relaxed segment—tension sufficient to cause pain. This, I suggest, is the physiological explanation of intestinal colic. Œsophageal pain which occurs when food is swallowed at too frequent intervals may well be called œsophageal colic. Its causation, like that of intestinal colic, is the same, namely, as disturbance of "the law of the intestine."

In a case of intestinal obstruction when peristalsis occurs in the segment of bowel immediately above the obstruction, relaxation or inhibition comes to an end at the seat of the obstruction. The contracting wave following causes greatly increased tension and pain results. Pain occurring at intervals in the same position strongly suggests an obstruction at the site complained of.

In lead poisoning the "law of the intestine" is disturbed. Pain of two kinds is experienced, one continuous, the other intermittent, colicky. I make the suggestion that the continuous pain is due to increased tension on the sensory vagal endings caused by persistent increase of plastic tonus from the irritation by lead of the splanchnics. Hunter and Royle's cases show that unrestrained activity of the splanchnic may be responsible for stubborn constipation. Their observations lead one to the suggestion that the constipation of lead poisoning is due to a similar cause. But of this there can be no doubt, the pain, both colicky and continuous, and the constipation are the result of interference with "the law of the intestine."

I suggest too that disturbance of "the law of the intestine" offers an explanation for the occurrence of intussusception. Why is intussusception so often found *post mortem*, without having produced any symptoms, without having had anything to do with the actual cause of death? It is held and rightly that this form of intussusception occurs before complete somatic death has taken place, when the local myenteric reflex may still be responsive to stimuli such as carbon dioxide or want of oxygen. One would not expect the myenteric reflex to work harmoniously in the dying state or to be properly controlled by the central nervous system. Incoordination between contraction and relaxation would be highly probable. Relaxation may well be too advanced, the contracted segment may readily slip into or be received by the unduly relaxed part and the condition of intussusception result. We may, I suggest, employ similar reasoning to explain cases of intussusception that are of such common occurrence, especially in children in whom disturbances of coordinate acts are so frequent.

From what has been said it will be seen how many and diverse are the conditions that result from a disturbance of "the law of the intestine," but there are many others which are characterized by quite different symptoms, the chief of which is distension. Distension of the abdomen is a very common condi-

tion. (I leave out of consideration those forms of enlargement due to fluid or tumours.) It is seen in rickets, in many infective states such as pneumonia, peritonitis and septicæma and especially in Hirschsprung's disease in which the abdominal enlargement is most pronounced. The distension of the bowel is the cause of the enlargement in all these conditions.

It is a common belief that the cause of the distended bowel is due to the distending force of the gas within it. But why does gas accumulate in the bowel? If "the law of the intestine" is in operation, the distension caused by the gas, being the adequate stimulus, should evoke peristalsis and lead to expulsion of gas. As a matter of fact peristalsis is active in many conditions where there is great abdominal distension, as is evidenced by the diarrhœa, frequently severe, that accompanies the distension and by the fact that there is no pain; "the law of the intestine" proceeds in an orderly fashion. The distended intestine, then, is to be looked on as a condition of altered or lowered plastic tonus, just as the dilated heart, say in pneumonia, is to be viewed as due to diminished plastic tonus. It is the lowered plastic tonus that allows of distension and the accumulation of intestinal gases. The bowels vary as to the state of distension even in health and this variation is an expression of varying states of plastic tonus.

In septic states the distension is due to diminution of plastic tonus—the effect of toxæmia upon the sympathetic. The distension of rickets expresses the lowered plastic tonus of the sympathetic which like all other tissues in rickets, is affected by the general state of malnutrition.

In Hirschsprung's disease or megacolon or congenital dilatation of the colon we have very great enlargement of the colon, considerable hypertrophy of its muscular coats and kinking at the pelvi-rectal flexure. With regard to the last named it must be admitted that the kinking produces a block, but this kinking, it appears to me, should be regarded as secondary to a primary block in this situation. What is the nature of this primary block? If the patient is in the knee-elbow position, as Hurst has pointed out, a rectal tube may be passed into the colon through the pelvi-rectal flexure without difficulty. The block then is not due to narrowing of the gut nor due to spasm. Nevertheless the block is effective, as is shown by the fact that there is great hypertrophy of the muscles of the colon which could only arise from continued efforts to overcome an obstruction. Hurst[9] has pointed out that a similar condition is found in the œsophagus in so-called cardiac spasm.

In this condition which he calls achalasia of the cardia there is great dilatation of the œsophagus in which food stagnates even to the extent of six hundred cubic centimetres hypertrophy of its muscular coats and a closed cardia. By X-rays violent peristaltic waves may be seen to continue for long periods without overcoming the obstruction at the cardia. Hurst has shown that in such cases the mercury tube, a hollow œsophageal bougie filled with mercury, drops easily through the cardia, no force being required. It can be withdrawn with equal ease. There is therefore no spasm in such cases and no mechanical obstruction. The contraction waves are unable to force the food onwards because of the fact that there is no accompanying relaxation of the cardiac sphincter which normally occurs as the contraction phase of the peristaltic wave approaches it.

The similarity between "achalasia" of the cardia and Hirschsprung's disease, pelvi-rectal achalasia, is very striking. It is evident that "the law of the intestine" fails in both cases, that the contraction phase is not accompanied by the relaxation phase and, as we have seen, this depends on the functional and structional integrity of Auerbach's plexus. Therefore the conclusion seems justified that both these conditions are the result of a defect, congenital or acquired, of Auerbach's plexus or its central controlling fibres.

In support of these views let me quote from Hurst's paper on achlasia of the cardia:

> In rare cases achalasia (of the cardia) may be due to a lesion of the vagus, degeneration of which was discovered in one case by Krause, this may also have been the cause in a boy in whom achalasia developed after whooping cough (Rolleston), and in a man under my own care who had no knee jerks or ankle jerks, but a negative Wassermann and no other evidence of nervous disease.

It would appear, too, that in congenital pyloric stenosis we have a condition which has much in common with achalasia of the cardia. Indeed in one of Hurst's cases of this latter disorder the disability was removed by division of the muscle fibres of the cardiac sphincter, as is done in Rammstedt's operation for pyloric stenosis.

But an adequate discussion of this subject would require more time than is at my disposal. I content myself for the present in suggesting that pyloric stenosis is an expression of a grave disorder of "the law of the intestine."

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SOME ASPECTS OF ENLARGEMENT OF THE ABDOMEN IN CHILDREN FROM THE SURGICAL SIDE.[1]

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THIS paper in no way pretends to be an exhaustive account of the conditions that may cause enlargement of the abdomen in children from the surgical side, for apart from other conditions the renal anomalies that affect the size of the abdomen, merit in themselves a separate paper. I am merely chronicling some of the surgical conditions that I have met with from time to time.

Tuberculosis of the Abdomen.

Tuberculosis of the abdomen in children, like pulmonary tuberculosis in them, is of much rarer occurrence in this country than is it on the other side of the world and the fact that struck me most on visiting children's hospitals in England was the enormous difference in the frequency of tuberculosis of these two regions, there and here. *Tabes mesenterica* or tuberculosis of the mesenteric glands is but seldom clinically recognized here; it is infrequent to get masses of caseous glands large enough to allow them to be readily palpated, though occasionally one may find discrete nodules that can be reached on deep palpation. Again, one very rarely sees them during operations within the abdominal cavity, although as might be expected, one runs across a calcareous healed area every now and then.

I have in my mind a case in which was found a large caseating, suppurating gland ready to burst and scatter its infective contents throughout the peritoneal cavity; this was a cystic swelling the size of a mandarin orange and the only other glands involved were a few not caseating in the immediate vicinity. This gland was quite easily extirpated and the child, though this was some fifteen years ago, has shown no further signs of tuberculous trouble.

I find that I have record of practically no cases of tuberculous peritonitis in the last seven years. This is undoubtedly due to the fact that patients suffering from this condition are no longer and I think quite rightly, put under the care of a surgeon. There is, however, a type of case in which surgical treatment used to be favoured and as I shall describe later, still has its value. On the other hand the unsuitable types are saved from harmful interference.

Tuberculous peritonitis is commonly described as consisting of three forms, the ascitic, the fibrous and the nodular or loculated. These are all phases or stages of the same process.

In the ascitic form we find the abdomen enlarged, the superficial abdominal veins distended and free fluid in considerable quantity. The diagnosis will be made by the chronicity of the condition and the lack of other factors to cause the ascites, such as hepatic, renal or cardiac conditions. There will probably be no response to the von Pirquet skin test in the early stages. This test will therefore be of no value; later, when the process has become well established and caseation is present, a reaction will be obtained. In this stage of ascites it is not uncommon to find the omentum thickly studded and infiltrated and rolled up into a cord across the abdomen. This stage of ascites is seen when the peritoneum is thickly studded with small tubercles and when they have not undergone caseation. The rolling and thickening of the omentum is more common in the loculated forms in which the tubercles have increased in size and caseation is present.

The fibrous or adhesive form is a reparative type in which there is a tendency for the tubercles to become encapsulated and so for recovery to take place. When the process progresses, there is much matting by coalescence of caseating masses and the formation of loculi, sometimes one, generally several, whose contents are of the usual tuberculous abscess type. The children are usually affected at from five to nine years of age and it is very rarely seen in infancy.

Finkelstein and Rohr have given the relative frequency of the exudative form at 35.5%, of the adhesive form at 47% and of the ulcerative form at 19.5%. They also have found that the incidence of tuberculous peritonitis among children admitted to large children's hospitals in Germany was from 0.2% to 0.34% and that the death rate in these hospitals from the disease varied from 1.5% to 5.3% of all children dying in hospital.

In Sydney we find that the incidence among the children admitted is 0.065% and that the death rate is 0.3% of all children dying in hospital. I think there is no doubt but that these children should be treated by conservative medical methods, heliotherapy, good feeding, tonics and so forth. Both X-rays and ultra-violet rays have been used with good results. Some years ago it was the custom to treat the ascitic type by evacuation of the fluid either by paracentesis or by cœliotomy with closure of the wound and no drainage. Either air, nitrogen or oxygen was injected at the time of evacuation. Many of these children did well and a single or sometimes a second or third removal of the fluid led to a cure, but in many the result of the treatment was disappointing; the condition went on to the ulcerating form. The explanation of the improvement was that the original ascitic fluid was thrown out at an early stage in response to the mechanical irritation of the tubercles and that when withdrawn, it was replaced in some measure by serum richer in antibodies. Unfortunately the progressive surgeon was wont also to open the loculated forms and when he discovered pus, was accustomed to drain with the usual result; any tuberculous abscess that is drained, always becomes secondarily infected. There is the added septic absorption and in these cases a fæcal fistula generally developes to add to the misery of the picture. It was this

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on November 27, 1924.

ill-advised selection that has caused opening the abdomen in cases of tuberculous peritonitis to come into disrepute, though I am quite sure it has its place as a help to medical measures in the exudative type.

Somewhat difficult to distinguish at times from tuberculous peritonitis with fluid is chronic pneumococcal abscess within the abdomen and this condition is by no means as uncommon as might be expected.

Pneumococcal infection of the abdomen may occur in three ways. It may be a primary condition; it arises in girls from three to five years of age and the infection is through the vagina and Fallopian tubes; the abscess is primarily pelvic. It may be a metastatic condition during the course of an acute pneumonia; it may arise anywhere in the abdominal cavity. Thirdly, it appears in the upper portion of the abdomen and is due to a lymphatic spread through the diaphragm; it is usually associated with an empyema. These always originate as an acute process, but in some owing to a lower virulence of the infecting organism or a greater resisting power in the individual they, like empyemata, may become chronic and the cavity may be filled with thick pus and fibrin.

When the abscess originates in the pelvis it may assume a huge size, completely filling up the abdomen. I have operated on two patients in whom I have been unable to reach with my finger through an incision made below the umbilicus the matted intestines in the upper pole of the abdomen when the pus was evacuated. These children tend to heal well, but in one of the huge collections, as may happen in an empyema, the intestines were too matted to expand and there was still a large cavity in the pelvis at the end of three years at which time I lost sight of the patient.

The sub-diaphragmatic type of abscess on either side tends to point in the direction of the navel and is frequently mistaken for a tuberculous abscess opening at that point. This type always does well with free drainage.

Hirschsprung's Disease.

Congenital idiopathic dilatation of the colon or Hirschsprung's disease is by no means uncommon. The dilatation may be of the whole or part only of the colon, but the pelvic colon is always involved. It is not merely a dilatation; hypertrophy is always present. It has been attributed to such causes as kinking of the gut, stenosis, sphincteric spasm with consequent dilatation and hypertrophy, but no actual site of obstruction has, I think, ever been found and it is undoubtedly of developmental origin as it is found soon after birth. I have seen it at the ages of two and three weeks and the existing hypertrophy at that date proves its developmental origin; it is probably a reversion to some ancestral type.

In these cases the abdomen is distended, constipation is severe, the motions are foul and large, peristaltic waves may be seen usually in the directions of the ascending and transverse colon and also a second wave of smaller size from the splenic flexure to the pelvis; the constipation may become complete. I have known over a gallon of fæces to be evacuated after some four months of absolute constipation. These children lead a miserable existence, being weakly, anæmic subjects with coprostasis in its worst form. There is always a constant abdominal discomfort. Happily they generally die early, as the result either of a block or they succumb easily to some intercurrent affection usually one of the exanthemata.

The treatment of these children forms the chief subject of interest. Should the bowel be loaded with fæces or obstruction be present, it should be emptied by repeated enemata. The bowel should not be opened and drained above the area of impaction. The reason for this is that the patients stand the operation very badly while in this condition; they may die in a few days from asthenia; the abdominal wound is prone to severe infection and I have more than once seen it gape and extrude intestines; acidosis is apt to develope and the patients may die quickly.

The treatment for the obstruction is to empty the bowel by repeated enemata. Once empty the question of further treatment arises. The patients never lead a comfortable or healthy life with enema evacuations and when left to their own resources inevitably become constipated again. Surgical intervention with all its risks and severe mortality must therefore be undertaken. Dowd gives the mortality at 26% for the one-stage operation, 16% for intra-abdominal operations in two stages and 18% for extra-abdominal operations in two or more stages. A colostomy is not to be thought of as a permanent measure. A colostomy life from childhood onwards would be worse than the original condition and obviously the only curative measure is that of a colectomy, a severe operation at any time and particularly so in such a subject. The question that arises is which is the best method to go about it. Probably the operation of Mikulicz is the best.

His operation consists in excising the colon and he leaves a fæcal fistula with the pelvic colon and the free end of the bowel, that is the lower end of the ileum, stitched side by side to the edge of the wound and makes no attempt for the time being to do an anastomosis; later the adjoining surfaces of the bowel are crushed by forceps and later still a plastic repair of the abdominal stoma is performed. Another method is to do a preliminary anastomosis between the pelvic colon and the lowest portion of undistended gut and later a colectomy. A third method is to perform a preliminary colostomy and anastomosis and later a colectomy.

In a colon that is completely involved, the mesentery is usually long and I have been able without difficulty to excise the whole colon through a seven and a half centimetre (three inch) incision, the whole of the mesocolon being easily drawn into the wound. In other cases the incision must be long and the hepatic and splenic flexures mobilized in the usual way.

A drawback to the operation is that, as the pelvic colon is always involved, the anastomosis cannot

be made below the region of dilatation and a small pocket must always be left.

A condition difficult to differentiate from the preceding is one of dilatation of the colon which does not seem to be a congenital condition and which is not associated with hypertrophy. In these cases there is usually a limited amount of dilatation confined as a rule to the pelvic colon which is dilated and thin walled; in this type the peristaltic waves as in the hypertrophic form are not seen; the symptoms are constipation with foul stools often passing into a massive retention. There are the usual constitutional signs of copræmia and the clinical appearance closely resembles that of cœliac disease. The patients can be kept fairly comfortable with purgatives and enemata.

Chronic Intussusception.

Chronic intussusception unlike the acute form is never seen in infants. The latter is essentially an affection of early life, in the great majority of the cases it appears from the age of three to ten months, while the former when it is seen in children, is found from six years upwards.

The chronic type is usually an intussusception of colon into colon and has frequently a polypus as the starting point. The intussusception of large bowel into large bowel even in the acute cases tends to be less severe than one with the apex more proximal and probably the chronicity in older children is due to the fact that the mesentery is shorter than in infancy and the bowel has greater difficulty in moving onwards throughout the whole course of the colon. Added to this, on account of the large calibre of the bowel, nipping is less severe and the passage of fæces is possible through the larger lumen. Like the acute the chronic form is signalized by the sudden onset. Later there are the attacks of recurrent abdominal pain, vomiting is frequent, fæces are passed, but blood and slime are not. The striking features of its progress are the rapid emaciation and the flattened abdomen through which the intussuscepted mass may often be seen and always easily palpated. The patients emaciate rapidly and may die in four to six weeks. The treatment is easy; it is to expose and reduce the mass which is generally quite simple and there is no need for a resection; a polypus or similar causative factor must be looked for and dealt with.

Renal Tumours.

The renal tumours are the commonest cause of enlarged abdomen in infancy and there are usually two varieties of tumour found, the one the extremely malignant, mixed-cell type composed of embryonic tissue, such as the nephromata or Wilm's tumours and the other, the congenital cystic kidney.

Both may reach a large size and cause enormous distension and can be distinguished from one another mainly by the smooth, rounded surface of the rapidly-growing, malignant tumours as compared with the slower-growing lobulated surface of the cystic kidney.

The malignant form is practically always seen at an advanced stage and there is always early involvement of the renal vein. Though these growths are not difficult to extirpate, recurrences are the rule and I have never seen a patient recover.

Unless the cystic condition is giving rise to trouble on account of its size, it is better left alone, as the same condition is usually found sooner or later in the other kidney. Even though the growth may be large, there is generally a considerable amount of kidney unaffected, capable of subserving the necessary vital function.

Sarcomata may affect kidney or liver and in children are frequently retro-peritoneal in origin and these are the form of sarcoma most frequently seen.

Other Tumours.

Other tumours found are lipomata of the mesentery; I have seen one so large as to cause obstruction from stretching of the bowel over it.

Cysts of the mesentery are occasionally found and are of interest on account of their origin which may be as: (i.) dermoids, (ii.) cysts of intestinal origin such as (*a*) sequestration from the bowel during development, (*b*) cysts arising from Meckel's diverticulum, (iii.) cysts arising from retro-peritoneal embryological structures, such as the Wolffian body or the Müllerian duct.

They are uncommon and when small give rise to no symptoms; later they tend to set up a slow obstruction from stretching of the intestine over them. Attacks of colicky pain, distension, vomiting, but no diarrhœa are found in such a condition.

Ovarian cysts are occasionally encountered. I have seen one as large as a fœtal head in a child of twelve. In this case though the abdomen was enlarged by the swelling, attention was drawn to it only when the pedicle became twisted.

OBSERVATIONS (MAINLY PSYCHOLOGICAL) ON THE CONCEPT OF MENTAL DEFICIENCY.[1]

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THE social and educational problems arising out of or associated with mental deficiency are gradually assuming first-rate importance in the States of Australia and in New Zealand. At conferences of medical, educational, psychological and charitable organizations the subject looms large. Associations have been formed for the purpose of awakening public opinion on the subject and urging Governments and Parliaments to pass the necessary legislation. At last Australia and New Zealand are beginning to get into close grips with problems for the solution of which definite lines of action have been taken in other lands for many years past. Australia can show a long list of enlightened officials, both medical and educational, who have

[1] Read before the Section of Mental Science and Education of the Australasian Association for the Advancement of Science, Adelaide, on September 26, 1924.

in isolated times and places spoken and written on the responsibility of the community in dealing with the social consequences of mental deficiency.

This growth of interest in the welfare of the subnormal individual is highly commendable; but it is now imperative that sporadic efforts should be made continuous and systematic. Unfortunately the increased publicity has brought in its train such a confusion of terms and such a misguided and over-estimated association of defectives with crime that the administrative authorities, as well as the general public, should be enlightened concerning the limitations which have been imposed upon the term mental deficiency by those who make a study of the subject.

Confusion of the Term.

There is a growing tendency in Australia and New Zealand to confuse mental deficiency with mental disorder or unsoundness of mind. Criminals with abnormal mental functionings, usually classed elsewhere as psychopaths, are popularly designated here as mental defectives. Even ex-service patients in our mental hospitals are frequently spoken of as mental defectives by members of Parliament and other public officials. In some instances feeble-minded persons are also psychopathic in mental functioning. But "psychopath" and "mental defective" are not synonymous terms. It is easy to understand how in the minds of the general public any abnormal mental functioning or mental breakdown may be regarded as a defect of mentality. It is said that the mind is not whole; that it is not sound; that there is a defect in its working. Hence the condition is readily referred to as one of mental defect and the person who is so conditioned, is called a mental defective. But an unsound or abnormal manifestation of mind is not usually connoted by the term mental deficiency. The mental defective is rather one in whom there is such a lack of mind, such an under-development of mental potential, that even when he attains the outward seeming of manhood (a period of growth when ordinarily maturity of mind is expected, carrying with it various social and individual responsibilities) he is far from being able to maintain a self-dependent existence, to care for himself without some measure of external aid or supervisory support. From early life the defective has been deficient in mental development. In the case of the higher grades the manifestations may not be pronounced in the first stages of growth, but they become clearly marked as the school years advance. In many instances owing to immaturity of mind as well as delayed physical development in various ways and the retarding effect of serious illness and other remediable physical handicaps, it may be very difficult to give a final decision regarding certifiable deficiency, though mental and pedagogical retardation is fairly certain. Mere deficiency as determined by scales of mentality is not necessarily actual mental deficiency certifiable in law. On the other hand some intelligences bloom late; their maturity is delayed. And indeed others who seemingly keep pace with the average ranks in the early stages, fall out as the environmental demands become too complex for normal accommodation. The essential characteristic is under-development, an original lack of mental potential so pronounced that mental growth is exceedingly slow and retardation increases with the rolling on of the years of life, inasmuch as the expansion of mental capital does not extend sufficiently to meet the normal requirements of society. This is what is usually meant by arrestment of mind. The defective is lacking in capacity to develope. On the other hand the unsound mind loses what it has attained. It may be reduced to the levels of mental deficiency, but owing to an inability to hold on to what is gained, there has been a falling back. This result certainly is due to a defect in structure or function (which may be specified); but the defect is not of the want of adequate potential to develope, but rather of the capacity to sustain growth and to secure proportion and equilibrium. In other words there is a disordered development. Such defect is not an original manifestation nor has it eventuated during the early periods of immaturity. It is an indication of mental decline, a sapping of the mind's foundations. Defect it is, but it is not defect of growth in the narrower sense, as is implicated in the term mental deficiency; it is defect to secure growth of mental order and balance. Accordingly it is quite understandable that defect of mind may be regarded as being comparable with unsoundness of mind or abnormal mental functioning and that the latter manifestations may be assumed to imply some degree of mental deficiency. In the one case apart from the very small percentage of secondary amentias the defect has been original, congenital; it refers to what was not there from the beginning. In the other the defect has come about by deprivation, wearing down, deterioration. In the former the *minus* or lack was primary; in the latter the *minus* or lack was secondary and opposed to a pre-existing *plus*.

So far as Australian legislation is concerned, the existing confusion in the connotation of the term mental deficiency is traceable to the Report of the British Royal Commission on the Care and Control of the Feeble-Minded (1904-08). In Recommendations 3, 4 and 68 the Commission suggested that in the English *Lunacy Act* of 1890 the word lunatic be replaced by the words mentally defective person throughout and that the term mentally defective be defined as comprising the following classes of mentally defective persons, namely: (i.) Persons of unsound mind (the term unsound mind was to stand as generally equivalent to the word lunatic and excluded the classes mentioned below), (ii.) persons mentally infirm (mental infirmity arising from age or from decay of faculties), (iii.) idiots, (iv.) imbeciles, (v.) feeble-minded, (vi.) moral imbeciles, (vii.), (viii.) and (ix.) mental defectives who are also either epileptic, inebriates or deaf and dumb or blind.

The Commission thus recommended that mental defective should connote both amentia and dementia, that is both mental deficiency (or feeble-mindedness) and mental disorder or disease, including

mental infirmity. Following upon Chapter 27 of the Report on the Causation of Mental Defect in which only the causation of mental deficiency (that is idiocy, imbecility, feeble-mindedness) was discussed, the Commissioners said:

> We have considered the desirability of employing some one general term to indicate the whole class of mental defectives for the purposes of certification and record, ignoring all subdivisions. This would be simplicity itself and much could be urged in favour of it. But we have adopted in preference the plan of definition and classification; because it is the common practice to degrade words suggestable of objectionable conditions which people are unwilling to believe to be applicable to themselves or their relatives. Hence the word "lunacy" has become more and more repellent until the use of it is indeed a hindrance in administration. The same sentiment in degree affects the use of the words idiot or imbecile and even the later word feeble-minded. But this feeling would be aggravated if the single word, whatever it might be, suggested for use as representing all classes of defects, became, like the word lunatic, a word which, in the general estimation, represented only or almost entirely the extreme or more repulsive forms of mental defect. An endeavour would then everywhere be made to avoid both the use of the word and the use of the organization for the care and protection of the several classes for which the State had made provision, but which would be inacceptable on account of associations connected with the name. . . . For such reasons as these we have recommended the use of the words "mentally defective" as a general term indicative of all classes of mental disorders, thus displacing the word lunacy from the position; for in certification at the present time there is hardly a question but that the word lunacy stands for the whole class and that, as lunatics, many mentally defective persons besides those who would strictly be called lunatics and idiots, are admitted to asylums.

The Commissioners further pointed out that "the utility of a satisfactory nomenclature is largely administrative"; still the classification of the various classes should "be in harmony with the best scientific opinion." And so it happened that because at a time when the care of mental deficients was not provided for by separate legislation, except for special education in schools, many were certified as lunatics under the *Lunacy Act*, it was decided to wipe out the term lunatic and substitute for it the words mentally defective persons in the interests of administration. In making such a suggestion the Commissioners were apparently thinking more of the defectives who require institution care and treatment, than of the large number who require only supervision and community guidance; and it was considered that the division of mental defectives (both the insane and the not insane) into specified classes would facilitate administration, for the diagnosis in terms of class would indicate the kind of institutional care that was most suitable in each case.

These suggestions of the Royal Commission were not carried out in the United Kingdom. Discussions on the report brought out the confusion that would arise from uniting disparate classes of individuals under one term, more especially as by far the greater number of defectives are not mentally sick, but rather need education and protection on totally different lines from the treatment necessary for the insane or mentally infirm. Accordingly the educational and industrial aspects of the mental deficiency problem became more prominent; but the obligations of preventive medicine to devise methods for the removal of causal factors were not overlooked. It was ultimately decided to legislate separately for the mentally defective and the mentally sick or mentally disordered, though for the purposes of administration both classes would ultimately come under the direction of the same controlling authority, so far as institutional care and guidance were concerned. Mental deficiency was thus dissociated in legislation from mental disease, mental disorder or unsoundness of mind, as mental deficiency did not connote mental illness.

The British Parliament then did not rush into legislation, as New Zealand did, immediately after the Commission had reported. The bill which followed on the lines of the Commission, was not accepted and eventually the existing *Mental Deficency Act* was passed in 1913, dealing with various classes of defectives and excluding the insane or lunatic. American State legislatures have followed the British practice in revised or new statutes and in many instances the definition of feeble-mindedness (mental deficiency) specifically excluded insanity.

The original suggestion of the British Royal Commission to include in the connotation of mental deficiency both unsoundness of mind and the extreme variations from the median line of average or normal mentality, as well as variations in mental functions due to the physical disabilities of epilepsy, blindness and deaf-mutism, was uncritically accepted by the Legislature of New Zealand in 1911. This was followed almost in identical terms by the Legislature of South Australia in 1913. It should be pointed out that the South Australian *Mental Deficiency Act* excludes the classes of feeble-minded and moral imbeciles. The first and only State in Australia to legislate especially for the feeble-minded class as well as for the lower grades is Tasmania whose *Mental Deficiency Act* was passed in 1920. Accordingly we have this anomalous position in Australia. Tasmania excludes insane persons from the operation of the *Mental Deficiency Act* and includes under the term mental defective the same four classes as the English Act; whereas in South Australia the term mental defective includes the legally insane, idiots and imbeciles and excludes the feeble-minded. In addition to this legislative confusion in Australia as well as New Zealand there is the popular misconception of the term to which we have already alluded.

While we are on the point of nomenclature, it might be mentioned that in the United States the term feeble-mindedness has until recently been generally used as an equivalent for mental deficiency as we have it. The specific term, moron, has been introduced to correspond with the specific use in English of the term feeble-minded. Now, through the influence of the United States National Committee for Mental Hygiene the generic term, mental deficiency, is gaining ground and conforming more with the prevailing practice in British Statutes.

Legal and Social Criteria of Certifiable Deficiency.

We shall now pass on to discuss more in detail the concept of mental deficiency. As ordinarily understood, mental deficiency is a legal term. Three classes or grades of deficiency are recognized, namely, idiots, imbeciles and the feeble-minded. Sometimes a fourth class is specified, namely, moral imbeciles (that is moral defectives), concerning whom the differential factor relates to temperamental or emotional instability combined with a lack of moral response to punishment. Feeble-minded persons are legally defined to be:

> Persons in whose case there exists from birth or from an early age mental defectiveness not amounting to imbecility, yet so pronounced that they require care, supervision and control for their own protection or for the protection of others or in the case of children that they by reason of such defectiveness appear to be permanently incapable of receiving proper benefit from the instruction in ordinary schools.

There is little difference of opinion concerning what persons are idiots or imbeciles. "High grade" idiots may sometimes be classed as imbeciles and "low grade" imbeciles as idiots for the purposes of administration, that is for segregation and control. Occasionally also for the same reason a "low grade" feeble-minded person may be classed as "high grade" imbecile. But as a general rule idiots or imbeciles are not confused with the feeble-minded. The outstanding difficulty is to determine the differential diagnosis between feeble-mindedness and normality (or as is frequently the case between feeble-mindedness and subnormality or border-line mentality).

In the British and Tasmanian acts (as well as in the acts of several of the States of the United States) the criterion is mainly a social one, though it is intended, as we shall see, that it shall be determined by psychological, pedagogical and medical conditions. The defectives require supervision or control in varying degrees for their own good. The kind and amount of social aid that is necessary, must, of course, be specifically determined for each case. The definition simply gives a general direction. The leading medical authority in English, Dr. A. F. Tredgold, defines amentia (or mental deficiency) as:

> A state of restricted potentiality for, or arrest of, cerebral development, in consequence of which the person affected is incapable at maturity of so adapting himself to his environment or to the requirements of the community as to maintain existence independently of supervision or external support.

Though the criterion here is mainly social; yet the underlying conditions are clearly psychological, as Tredgold himself admits, for social adaptability is dependent upon mental capacity. Though he makes reference in his definition to arrested cerebral development as a causal factor, yet as a matter of fact it is only determined indirectly from the pedagogical and psychological findings. Pathologically such a condition is directly discoverable and gives one an insight into the underlying neuronic deficiency, but it is not practicable in the greater number of cases of simple or primary feeble-mindedness, wherein the medical examination reveals little that is excessively abnormal or subnormal in physical development, viewed apart from the mentality. As Binet and Simon themselves admit regarding children:

> The medical method is indirect because it conjectures the mental from the physical. The pedagogical method is more direct, but the psychological is the most direct of all, because it aims to measure the state of the intelligence as it is at the present moment.

It is clear at all events from the legal concept that the determining factor is whether the alleged defective is socially or economically inefficient, that is whether he can earn enough to maintain himself for all his life independently of external aid. He may subsist for a while under specially favourable circumstances, but these beneficent conditions may not be permanent and as his years of life increase, the strain of struggling against the ever-increasing complexity of the social and moral environment will more or less get him down and force him into the ranks of the socially inefficient. Accordingly the defective is one who sooner or later will drift, find himself up against things and, lacking the initiative and spontaneity of his better endowed fellows, gradually give in and succumb to the inevitable; he is not able to sustain himself unaided. At best he may attain to an economic level which gives him no more than a bare subsistence while his physical powers are at their highest efficiency, but ultimately his inability to adapt himself readily to the changing conditions of life as he grows older brings him down below the level of industrial competence and self-dependent living. While, of course, this social result is common in many who are by no means mentally defective, and is brought about by varying conditions such as accident, industrial depression, mental illness, moral delinquency, physical ailments and so forth, yet in the case of the defective it is specifically due to his original mental inability or as the legal definition says, "mental defectiveness existing from an early age or at birth."

It is fundamental in administration of mental deficiency both in the interests of the individual and the controlling authority that an early diagnosis be made. Accordingly the controlling authorities usually adopt the progressive policy of discovering and registering defective children. Here naturally the social criterion is not operative. It does not obtain. It is necessary accordingly to differentiate between feeble-mindedness at school age and feeble-mindedness at adult age. The Act allows for the differentiation. In the case of children it lays down that they are certifiable for the purposes of special class instruction, when "they by reason of mental defectiveness appear to be permanently incapable of receiving proper benefit from the instruction in ordinary schools." As many of the higher grade among feeble-minded children are so improvable under special instruction that they are able after leaving school to earn enough to keep themselves, particularly if they are mentally stable and suitably placed, there is no immediate occasion to notify these individuals for certification after school age. Accordingly every certifiable individual at school age is not necessarily a certifiable individual after school age. A school system which

supports an adequate number of special schools and special classes, is likely to show a larger proportion of certified mentally defective children than a school system which does not adequately provide for these children. It happens then that numbers vary often times in accordance with the ability of the school administrative authority to meet the demands of special or individual instruction.

At all events the certifying authority must come to a final determination concerning any child alleged to be defective either at fourteen years of age or at sixteen years of age as the case may be. As the child has not reached an age nor had sufficient experience in the world to determine (other things apart) whether he is able to support himself, it is clear that the examining authority has to prognosticate in some measure his industrial career. It will always be a difficult matter in the case of such individuals as are near to the border line, more particularly as "tested deficiency" is not always equivalent to legally certified deficency. Fortunately modern legislation provides for the method of supervision under which they are given a chance to make good, without much restraint upon their freedom of action and under which they are able to receive advice during periods of stress due to unemployment and other unfavourable circumstances. The legal pull of supervision may accordingly be tightened or released in the interest of the defective.

Certification then is very largely determined by social inefficiency. In the case of adults there is usually actual evidence of it, but in the case of children it has to be anticipated. Accordingly, apart from other reasons, it is desirable to centralize as far as possible the certifying authorities so that they may be as uniform in practice, in diagnosis and certification as possible and that these same authorities may have direct knowledge of and continuous contact with defectives from school age right on throughout their lives, either at large in the community or under care in institutions. A central clinic or bureau is indispensable for this purpose and its serviceability increases with the accumulation of data concerning examinees over a long course of years.

As already mentioned social inefficiency of itself is not sufficient to determine mental deficiency. The legal interpretation of the concept lays stress on the social criterion and makes it the main determining factor in certification, for ultimately a judicial authority is called upon to give a final decision as to whether any person is to be certified definitely as a mental defective and such an authority is guided by the evidence as to whether the alleged defective is capable of maintaining and supporting himself as a self-dependent member of society. At the same time, however, it specifies mental defectiveness either congenital or manifested in early life as the underlying condition. Accordingly it is necessary to make clear as far as one can what is meant by mental defectiveness.

The deficiency in mentality must be so definite that it is manifested at least from an early age. The legal mind has at times been perplexed at this phase "existing from birth or from an early age" and in the courts magistrates have asked for special evidence of this fact. In many cases of adults it is not forthcoming, when parents or early guardians are dead and when no direct confirmation of retardation is obtainable from school owing to the removal of teachers and the want of records. In Tasmania these difficulties are specially provided for in Section 13 of the *Mental Deficiency Act*, namely:

> In certifying that an alleged defective is a defective within the meaning of this Act . . . the examining authority shall endeavour to obtain contemporary evidence of the existence of the mental defect either at birth or from an early age, but such evidence shall not be considered absolutely essential for determining whether an alleged defective is a defective within the meaning of this Act.

As this legal point does not occasion an insuperable difficulty in the mind of the psychiatrist or psychologist, there is no need to make further comment upon it. It is more fitting to analyse the concept of mental defectiveness and find out if possible what it specifically consists of and whether it may be (if at all) definitely determined.

Deficiency of Mind.

Deficiency means want or lack of something, a falling short, incompleteness as regards some standard of development or achievement. Accordingly deficiency is measurable; it relates to some amount of difference as between actual attainment and what is expected or anticipated under normal or average conditions of growth and progress. Considering deficiency of mind or mental defectiveness (amentia it is called) apart from neuronic deficiency, we do not mean that there is absence of mind or that there is some gap, some void, a sort of mental vacuum, as it were. The deficiency rather relates to an inabilitiy to function as one normally developed in mind when compared with the ordinary run of individuals in human society. The defective has no "break" in his mentality; he does not know himself as mentally short. To himself he is not "incomplete." In personality he is one, a whole undivided; he is certainly not a conglomerate of unevenly developed or unevenly related constituents or processes; there is no internal disorganization in his mental make up. He functions completely within his mental orbit. He is usually no more conscious of his "deficiency" as such than a person of normal mental development is conscious of "deficiency" as such when compared with superior men and women. He may notice disparities which are mostly marked as want of opportunities for indulging inclinations (even of the good sort) and thus for increasing satisfactions; but he is not likely to account for these in terms of mental lack of whatever sort it be. But inwardly the person is complete in himself. He reacts as a totality. His limitations make no "break" in his mind. Accordingly deficiency is a relative term. It is determined in accordance with a scale of efficiency measurable in terms of attainment in life or of ability to adjust oneself on one's own initiative or in reliance upon one's own strength to the ever-changing conditions set by the moral, social and

physical environments of mankind. The inefficiency is particularly noticeable in decisions, practical judgements, want of reasonable appraisal of one's attainments. Deficiency of mentality thus implies a valuation of mental output, of mental energy, of mental adjustment. This valuation is not made by the individual himself, but is determined by the ordinarily accepted standards of the society in which he lives. There will be variations in value according to the attitude and point of view of the evaluating authority.

As regards deficiency then there are no absolutely fixed quantitative standards by means of which mental efficiency can be determined with reliable accuracy as is the case with physical measurements. Though we are able somewhat to "measure mind" in accordance with a common scale of mental measurements and though this enables us to distribute quantitative valuations of mental output or ability, we find it exceedingly difficult to fix a line of demarcation which will differentiate absolutely those who are mentally efficient from those who are mentally inefficient. We know of a surety that the weakest in mental capacity will distribute themselves among the lowest grades of the scale and that the strongest will do so among the highest grades of the scale. But the final determination of what individuals are mentally defective both psychologically and socially is largely subjective or qualitative, for mental deficiency does not connote a peculiar species of mind organically distinct from normal mentality. Mental defectives do not constitute a group by themselves with specific characteristics either of psycho-physical structure or function, excepting the distinctively pathological persons whose outward seeming of deficiency is clearly apparent to anyone. They vary negatively from the below-average distribution on a scale of mental measurements, the lowest grades among them more so than the highest. Respecting the highest among negative variations below the average distribution, examiners may have great differences of opinion as what individuals will be classed as mentally defective for various purposes, social, educational, legal. And the classification will vary according as one is dealing with matured and immatured intelligences and according as the nature, purpose and period of control legal, social or educational, which is enforceable for the benefit of the individual.

In view of the differences which are involved in differential diagnosis, it is desirable to ascertain the general lines of agreement which may be accepted in determining what constitutes mental deficiency, more particularly for the purpose of legal certification whether for socio-legal control or for special instruction in school. Everyone will agree that the problem concerns the feeble-minded rather than the lower grades of defectives. The first point which requires examination is the connotation of mentality in the term mental deficiency.

General Mental Ability.

What do we mean by "mental"? Does it simply mean what is so commonly called intelligence, the capacity to adjust oneself to the changing situations of environment, involving what is known as the common processes of intellection, attention, perception, memory, imagination, reasoning, whether dealing with ideas or symbols or concrete materials? Even the primitive endowment of instincts and emotions must function intellectively, if the individual is to adjust himself adequately in mind to reality.

Intelligence includes native ability to distil from the world of objects, stimulating the senses whether directly or through the agency of instruction, the elements which the intelligence itself refines and moulds into the marvellously intangible patterns which we call thoughts, so far removed from their source of origin as to deceive us as to their *quondam* relations with the humble things of earth. It is one with the spontaneity of life itself—the mental functioning that makes us kin with the order and system of the world in which we live, that awakens interest in all things human, that craves to know and demands knowledge, that forces the mind out of itself into the larger world of ideas built up by man's cooperative enterprise throughout the generations and enmeshed in what we call racial heritage. The mind grows on what it feeds like anything else, but the power to seek mental nutriment and to discriminate what is provided, resides in the intelligence. Growth must come from within; what forces it on is original endowment and any defect of the mechanism of functioning must render it inefficient and retard progress. Without an adequate capital in the form of ideas and images the intelligence cannot work satisfactorily and these must, as we have hinted, ultimately come from contact with things through perception. There is in man an original drive to lay hold on things and forge mental instruments for the better handling of the raw materials of knowledge. Man's ability to obtain this capital and increase it is dependent upon his acquirement of language and his facility in handling its intricate mechanisms. Any defect in the working of the fundamental mental processes such as attention, audition, visualization, representation, analysis and synthesis and so forth, will restrict efficiency in language development. A mind ill-equipped with the instrumentalities of thinking that grow through the growth of language, that is with the accumulation of ideas and the correlative ability of self-expression, cannot attain to the level of abstract thinking where the intelligence is completely at home with itself, where it works creatively and organizes the various mental processes with consummate ease.

The outstanding psychological characteristic of mental deficiency is a marked inability to react adequately to language stimulation. This trend early manifests itself in the school child and it constitutes a danger signal. Where the defect is permanent and irremediable, ordinary school instruction will be of little benefit. Before it can be determined whether this deficiency is inborn and diffused rather than specific and occasional, it is necessary that the child should be tried extensively in individual stimulation of the primary processes of attention and memory and if they cannot be helped to func-

tion efficiently so as to make good their defects within a reasonable measure of time, it is fairly certain that mental retardation will increase with the growth of years.

Feeble-Minded Levels and Variations of Function.

Apart from scholastic measurements deficiency in language development can be determined fairly well by the Binet scale if qualitatively interpreted. The merely quantitative valuation of the result is not of itself sufficient. Any matured mind that does not attain a level of intelligence indicated roughly by a mental age of ten years or falls below an intelligence quotient of sixty-five, should be carefully examined for the purpose of determining the nature of the defect, whether it is specifically a language disability which may or may not be compensated for by motor reactions sufficient to meet the requirements of a self-dependent social unit or whether there is some abnormal functioning of mind. As the lower mental level of adult or adolescent feeble-mindedeness in the narrower use of the term is usually about mental age of seven years, the problem is to determine what individuals are certifiable as defective, whether for institutional care or supervision, whose mentalities range between mental ages of seven years and ten years. In the case of school children the upper limit of the range would extend to an intelligence quotient of sixty-five and in certain exceptional cases it might reach a little higher. All such examinees may be said to function at "feeble-minded" levels, but not all of them would be certifiable by a competent examining authority under a mental deficiency act. Certification depends upon diagnosis and diagnosis involves more than mental measurement. The value of the Binet scale in the determination of mental deficiency is mainly in its exploratory use. It enables us to compare examinees on a common scale and sift those who are able to reason and frame judgements sufficiently to meet the minimum requirements of language for self-dependent cooperation with their fellows in the humbler tasks of life, from those whose mental endowments are apparently of such a low order that they may be reasonably suspected of being socially inefficient, even before any evidence of social inefficiency is ascertained. An uninterpreted Binet *quantum* is useless for the purpose of diagnosis. It is not an absolute measurement of mental deficiency. The reactions of each individual under general intelligence examination must be specifically observed and set forth. They throw a good deal of light on his mentality and an analysis of them will usually indicate whether special factors are operating or whether there is an all-round deficiency in mental development.

One will no doubt find many instances of adolescents and adults with mentalities above mental age of ten years, even as high as twelve and thirteen years, who are so temperamentally unstable that for various specific reasons they are unable to support themselves independently in the world and become a burden on the State as well as on their own families. Many of them are to be found in the gaols and other places of detention. But they are not feeble-minded. Some among them may be classified as border lines or even inferior normals so far as their mental development is concerned and their mental functioning may be psychopathic, psychotic, feebly-inhibited and so forth. Individuals who grade above ten years, should not as a rule be certifiable as mentally defective, though many of them may be subnormal in intelligence. It is the inclusion of these emotionally erratic and feebly-inhibited persons among the feeble-minded that helps to raise so inordinately the percentage of defectives in the community. It is the psychopathic members of the border-line and subnormal classes who on committing serious crimes are so frequently dubbed mental defectives by popular prejudice. Thus there is brought about the unfortunate unqualified association of mental deficiency with criminality which has not been substantiated by any reputable investigation.

At all events it is clearly certain that we cannot grade unstable individuals as feeble-minded on the fact that they happen to be well below the average measures. They possess a mentality which, if it functioned simply and directly, uncomplicated with emotional unbalance, should enable them to acquit themselves as useful and honourable members of society, but owing to temperamental deficiencies they do not submit to the ordinary conventions and moral standards of the community. A very small proportion of these morally unstable characters who possibly possess an intellectual level amounting to more than feeble-mindedness, may be specially classed as moral imbeciles or moral defectives within the provisions of the British and Tasmanian *Mental Deficiency Acts*. They constitute a class apart which should not be confused with simple mental deficiency. As we have interpreted the term, mental deficiency implicates such a serious defect of reasoning and judgement requiring to be compensated for by community supervision and care, but not the submergence of reasoning ability and practical judgement by emotional or connative unbalance, vicious waywardness or other temperamental abnormality.

Attempts are being made to determine objectively deficiency (or rather excess) of will or emotion, but it is so difficult to equate test conditions with actual reactions in real life, that so far the results are not of value for practical purposes in diagnosis. Although we maintain that persons of borderline mentality as judged by ordinary standards who are emotionally unstable, impulsive, inordinately suspicious of or hostile to authority, paranoid in trend, psychopathic or constitutionally inferior, should not be classed as mental defectives (feeble-minded), even though they comprise a large number of the recidivists of the gaols; yet at the same time we are of opinion that the community should acquire the necessary legislative powers to hold them in permanent check and provide suitable institutions for their supervision and mental treatment as socially unfit.

From what I have already said it is clear that mental measurement in itself cannot be the sole determining factor in the differential diagnosis of certifiable mental deficiency from subnormality. No doubt it would make the task of classification of

individuals on a scale of mental measurement very easy, if we were able to locate them in various groups according to definitely fixed *quanta* or measures. It is usual in works of mental testing to find a distribution of intelligence levels in terms of intelligence quotients. But we must remember that the distribution is theoretical and serves rather as a guide to the placement of an individual on a common mental scale in comparison with his fellows. But the task of diagnosis involves a very great deal more than this and further the actual psychological classification in terms of mental level of functioning is not finally determined by the Binet scale. Indeed we must admit real difficulty in fixing the grade of mental development of any individual.

So far as any particular scale is concerned, one will find a great interlocking of the various grades in psychological distribution. There is no actually fixed line of demarcation in terms of the intelligence quotient, enabling us to determine definitely whether a given individual belongs to the feeble-minded class or border-line (subnormal) or any of the subdivisions of normality, determined by such scales as the Binet or Porteus. The ranges for intelligence quotients for persons actually classified as feeble-minded, border-line, dull or normal inferior overlap. There is no linear differentiation of these classes from one another. Other factors are required to determine them. All we can say is that with respect to the mental scale we have used, the examinee functions at a specified level which is theoretically regarded as the level of such and such class. To diagnose his mentality as a whole is another matter and necessitates a much more elaborate investigation. In clinical experience one finds persons with an intelligence rating as low as intelligence quotient sixty and sometimes even less whom one would unhesitatingly exclude from the feeble-minded class. When given a decidedly motor outlet in testing to compensate for inferiority in language responses, these individuals frequently excel and manifest a practical ability that enables them to make good in the community and even prosper in a reasonable measure. On the other hand one comes across individuals of subnormal mentality who, while possessing fair motor ability usually manifested in specific directions, yet are so feeble in initiative and application and so lacking in practical judgement as not to be able to utilize their mental powers for self-dependence. Generally speaking in terms of intelligence quotients the adult and adolescent certifiable feeble-minded individuals range round the fifty to fifty-five level, but as the mental ratio nears sixty and advances on to seventy the numbers of certifiable feeble-minded individuals (usually the more satisfactory supervisory cases) becomes markedly less and less. What this distribution signifies is that the greater proportion of individuals with intelligence quotients ranging from fifty-five to seventy are living peaceably in the community, performing various services, probably not over-weighed with responsibility. Legally they are not "feeble-minded," though their intelligences are far below the median grade of mental development. It is questionable whether they should be referred to as "feeble-minded" at all in view of the fact that they apparently possess just sufficient practical capacity to maintain themselves in sustenance. Psychologically they are frequently classed as feeble-minded or potentially so. But early mental and moral training as well as environmental blessings and simplicity of life, may strengthen them against social dangers. Of course they contribute their quota to the social problem, but it is not complicated wtih mental deficiency in the legal sense as we have explained the term.

At this stage of the discussion the problem of diagnosis becomes pressing, but it goes somewhat beyond the limits prescribed for this paper. In clinical diagnosis the various fields of examination, medical, social, psychological, pedagogical, vocational as well as personal and family history, are all synthesized and a synoptic view of the individual is presented, enabling the examining authority to determine the clinical type to which the defective belongs, his psychological status and function and the kind of treatment and control he requires.

Reviews.

REJUVENATION.

THE puppose of "The Theory and Practice of the Steinach Operation," by Dr. Peter Schmidt, it would appear, is to emphasize the importance of the Steinach procedure, based on the findings obtained from an analysis of one hundred results obtained in man.[1] In the majority of instances quoted and digested he shows both physical and mental rejuvenation. Just how potent and lasting these results reported will be only time will disclose. Some few patients were observed up to five years. We feel, however, that apart from the rejuvenation factor which may or may not prove transitory, the mental factor recorded is by far the more important, though in sooth, virility and potency may in certain instances be an index of this. Indeed, Schmidt labours to show that in many of the hundred cases cited a greater mental and intellectual vigour was evinced. This idea seems to have been seized by the novelist, for the same thing is described in Gertrude Atherton's "Black Oxen," where the sexual factor of the "Steinach" rejuvenation is entirely subordinated to the increased mental and intellectual alertness and power.

Although Schmidt disclaims for Steinach any similarity of procedure with the work of Voronoff who with others developed the work of gland transplantation inaugurated by Lydston, very similar results have been obtained by this group of workers. We have come to the conclusion that it might even be possible by invoking either of these procedures to postpone at least the deterioration of the mental powers and to prolong the ability to work intellectually by some years.

We note that Voronoff was invited to demonstrate his method before the Thirty-Second Congress of French Surgeons in October, 1923.

We submit that both the Steinach and gland transplantation procedures look promising in cases of premature senility, some psychoses and many endocrine dysfunctions and diseases, but more, much more material is necessary before this part of the great field of endocrinology can be regarded as quite clear of the wire entanglements belonging with the domain of academic criticism. We play the part of wisdom at least in giving place to a proper and reasonable appreciation of the possibilities.

[1] "The Theory and Practice of the Steinach Operation: With A report on One Hundred Cases," by Peter Schmidt, M.D., and an Introduction to the English Edition by J. Johnston Abraham, C.B.E., D.S.O., M.A., M.D. (Dublin), F.R.C.S. (England); 1924. London: William Heinemann (Medical Books), Limited; Crown 8vo., pp. 150. Price: 7s. 6d. net.

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The Protection of Eye Sight in Industry.

WITH the advance of modern civilization much greater strain is thrown on the human eye than was the case in mediæval and earlier times. The school boy at his desk often finds that he cannot see the black board as well as his fellow; the student who burns the midnight oil, complains of headaches and tired eyes; advancing middle age is accompanied by difficulty of near vision and, lastly, the industrial worker in many undertakings finds not infrequently that the constant use of his eyes in difficult and fine work, with perhaps inadequate or unsuitable illumination, is productive of symptoms which may be of some moment and which may possibly interfere with his working capacity.

Eye symptoms or injury in industry may be caused either directly or indirectly. It will suffice to quote one or two instances by way of illustration. In the printing trade the linotype operator with insufficient illumination will soon manifest eye strain from constantly trying to read accurately the fine letters engraven on the matrices which he is using.

In the same way the worker in the cotton spinning trade will find difficulty in threading the spool or picking up the end of the thread in the shuttle if the naked filament of an electric light bulb, unprotected by a suitable reflector, is constantly staring her in the face. An example of injury attributable indirectly to lighting conditions is seen when an accident happens in the glare of a strong light to an employee who does not see danger approaching him from a more dimly illuminated area. Although apparently no thorough inquiry has been made into this aspect of the question, it has been claimed by certain insurance experts that 25% of the total number of accidents are connected with inadequate lighting.

The whole question of the protection of eye sight in industry was the subject of a most interesting report issued by the Industrial Hygiene Section of the International Labour Office of the League of Nations, in June, 1923. The causes of eye strain are given very fully in this report. Thus, bad lighting compels the subject to place his eyes too near the table at which he is working and thus involves an effort at accommodation and convergence. Bending over the work occasions fatigue and is liable to cause myopia. The effects of working with insufficient light become manifest and rapid exhaustion of the eye results. A direct lighting system consists in a powerful light coming from a brilliant source. Dazzling light may cause a decrease in visual acuity, watering of the eyes and temporary conjunctivitis; it may occasionally lead to serious lesions of the inner parts of the eye. Eye strain may be determined by the rapidity with which the work is done in proportion to its delicacy and fineness, the brightness of the work, the distance at which the work is placed and the length of time during which it is done. Lack of constancy of light may be a determining factor. The ultra-violet rays of the luminous source as seen especially in certain forms of electric lamps must be regarded as constituting a great danger.

Excessive brightness of the source of light is held to be a cause of eye strain owing to exhaustion of the retina. Loss of visual activity also occurs if the illumination of the work is low and if constriction of the pupils is caused by peripheral vision of oblique rays coming from the source of light.

In considering the question of lighting a new factory the industrial hygienist will experience no difficulty; he can design the building to meet the necessary requirements. It is in the conversion of old buildings into factories that difficulty will be encountered. Good natural lighting should fulfil the following conditions. As much light as possible should reach the middle parts of the room; the light should fall on the place of work in the most convenient direction; the distribution of light on the place of work should be as uniform as possible; the colour and surface of the walls and fittings of the room should be such as to absorb very little of the light which falls on them; the machines and accessories should be placed in such a way as to cause few inconvenient shadows. Artificial light should resemble natural light as closely as possible.

Lighting should be diffused, it should be sufficient, it should be constant or nearly so and should be so arranged as to prevent glare either from the source itself or indirectly from polished surfaces. The system of installation may be either direct, semi-direct or indirect. The two latter systems are most restful to the eye. Sources of light thus arranged should give an intense light, but without dazzling the eye, they should cast soft shadows. In the semi-direct system the source of light should not be visible. In the consideration of local lighting, as in the case of the workers referred to above, the question of glare is most important. Efficient shading and avoidance of abrupt variations in candle power are essential and the same principles as in general lighting must be borne in mind. It is interesting to note here that the following formula was proposed by a departmental committee appointed by the Home Office in England to inquire into this question:

> Each lighting source (except those of feeble brilliance, that is to say with a brilliance not greater than five candles per square inch, *i.e.*, roughly one candle per square centimetre) placed at a distance of about thirty yards from the worker, must be protected in such a way that no part of the filament, the mantle or the flame may be perceptible unless it be placed in such a way that the angle made by the line reaching the eye from the unprotected part of the source and the horizontal plane be not less than 20° or in the case of a person working at a distance of at least two yards, 30°.

In regard to various devices intended to protect the eye against excessive light the use of glasses to counteract the penetration of ultra-violet radiation is of the first importance. It is unnecessary to enumerate the industries in which this protection is required. The use of glasses and the installation of guards to minimize the risk to the eye from flying particles must not be forgotten when consideration is given to the prevention of accidents.

The work of the medical industrial hygienist in the protection of eye sight will begin with the examination prior to the employment of an individual. Careful examination at this time and records made of the findings will help the medical observer at a later date when he wishes to determine whether or not loss of visual acuity is due to industrial causes. Constant supervision in regard to eye sight will be necessary after admission of an individual as an employee. Thus alone, as in every aspect of industrial medicine, can prevention be carried out.

Current Comment.

POTASSIUM AND CALCIUM IN CANCER.

IT has long been known that sodium ions increase the dispersion of the colloids of cell membrane and that calcium ions diminish this dispersion. A cell immersed in so-called physiological saline solution, that is 0.6% sodium chloride, undergoes an increase in size and the physical properties of both its protoplasm and its membrane are slightly changed. Ringer and Locke independently sought to provide a fluid that is truly isotonic to human cells. The former added to 0.7% solution of sodium chloride small quantities of potassium chloride, calcium chloride and sodium bicarbonate, while the latter used 0.9% solution of sodium chloride with slightly larger additions of the other salts. The hydrogen ion concentration of Ringer's solution is about seven, and that of Locke's solution is a little higher. The calcium in these solutions does not neutralize the effect of the sodium; how the potassium restores the balance is a little uncertain. There seems to be some disturbance of the rate of dispersion of the colloids of the membrane of cancer cells and this has been attributed to an altered concentration of potassium and calcium either of the cell protoplasm or of the tissue fluids. Much work must be carried out before it can be determined how these changes are brought about and in what way they affect the mitosis of the cell. As these physico-chemical properties of the cancer cell may be of fundamental importance, every scrap of information concerning the action of these elements on normal and malignant cells should be carefully noted.

Dr. Louis Herly has endeavoured to ascertain whether normal cells and cancer cells are damaged by immersion in physiological saline solution, Ringer's solution or Locke's solution.[1] Since the viability of normal cells cannot be tested in the same manner as that of the cells of transplantable mouse or rat cancers, he elected to test the functional activity of the cells by their relative avidity for oxygen, according to the method of Drew. In some preliminary experiments he determined that normal living tissue cells decolorize dilute solutions of methylene blue (1 in 50,000), while dead tissue has no such action. He then immersed suspensions of the cells of rat carcinoma and of the normal cells of rat's testes in the three fluids and incubated the suspensions at 37° C. for five hours. The results of these experiments are interesting. It appears that normal cells and the cells of the rat tumours are equally damaged by being kept in physiological saline solution for five hours and are damaged to a somewhat slighter extent by being kept in Ringer's solution for the same time. The amount of damage inflicted on the cells by Locke's fluid is much less.

Dr. G. L. Rohdenburg and Dr. O. F. Krehbiel have continued their studies on the relation of mineral salts to malignant tumours.[2] They have

[1] *The Journal of Cancer Research*, October, 1924.
[2] *The Journal of Cancer Research*, October, 1924.

used a method which appears to us to be open to some objection, if the results are intended to throw light on the behaviour of carcinoma and sarcoma of man. They first of all determined the potassium content of tumours in relation to their transplantability. Of four rat sarcomata that with the highest potassium content proved to be most readily transplanted. On the other hand a rat carcinoma and a chondro-rhabdomyo-sarcoma yielded about the same percentage of successful grafts, despite the fact that the former had 40.6% more potassium than the latter. Again, it was shown that the rat sarcomata with the lowest potassium content was the most susceptible to X-radiation. Studies were conducted to ascertain the effect of exposure to X-rays on the salt content of these tumours. At first an increase in the salt concentration was noted, but after about seventy-two hours the greater part of this increase disappeared. They also found that the parenteral introduction of either living or dead homologous protein produced demineralization of the blood of the animals, while the introduction of living or dead heterologous protein led to hypermineralization of the blood. The blood of an animal with a receding tumour was found to become richer in sodium, potassium and calcium, while the salt content of the tumour diminished. The same change in the blood occurred when any of these elements were injected into normal animals, while when gelatine was added, the total amount was unchanged, although the sodium content was increased. The exposure of rats without tumours to X-rays led to a lowering of the total amount of sodium, potassium and calcium of the blood, while this change was greater in rats with tumours. When an injection of sodium chloride was added to the radiation, there was a relative increase in the sodium content of the blood. This was much more evident in rats with tumours than in normal rats. The authors admit that there are innumerable difficulties in the way of a full explanation of the processes underlying the demineralization of the local cells and the hypermineralization of the blood. That there are some subtle bio-chemical processes involved in this variation of the salt content of tumours and blood is certain and until fresh methods of attack can be devised, it would be useless to attempt to interpret the findings.

CHRONIC BACKACHE IN WOMEN.

AMONG the more common symptoms complained of by women seeking medical advice is chronic backache. From the patient's point of view it is not only disabling but also progressive. There is possibly a certain amount of truth in the saying that "if a woman is not thinking of the salvation of her soul, she is thinking of the state of her uterus." The presence of backache tends towards the latter state of mind. From the point of view of the medical practitioner backache is important; it is often very difficult to relieve. It must also be remembered that backache may be due to causes other than those associated with the genital organs.

Dr. Daniel Dougal has recently written an interesting article on this subject.[1] He studied the case records of one thousand patients from his own consulting room. He found that two hundred and thirty-five of this number complained of backache. In one third it was the main cause of complaint. "Gynæcological backache" is usually confined to the lower lumbar or sacral regions. Its association with other symptoms renders its diagnostic value small. For this reason it is apt to receive little attention. The majority of Dr. Dougal's patients either had to earn their own livings or had heavy household duties to perform at home. Only 10% of the women were single women, 21% were *nulliparæ*, 23% were *uniparæ* and 45% were *multiparæ*. Backache was present in 29% of 227 patients with genital prolapse, in 59% of 44 with chronic cervicitis, in 42% of 108 with chronic endometritis, in 20% of 53 with chronic metritis, in 24% of 101 with adnexal and peri-uterine inflammations, in 18% of 82 with uterine fibroids, in 51% of 29 with adeno-myomata, in 25% of 35 with cancer of the cervix and in 9% of 31 with ovarian tumours. Ten patients with no gynæcological lesions complained of backache. It does not follow that backache in patients with gynæcological lesions was due to the lesions. Relief was not always obtained when surgical cure of the abnormality resulted. In his classification Dr. Dougal does not place retroversion and retroflexions of the uterus in a separate class, although they are commonly regarded as the principal cause of backache. He states that they do play a part, but not a predominant one; in his opinion the size of the uterus, the condition of its walls and the strength or otherwise of the supporting structures of the pelvic floor are of more importance in this respect than mere changes of direction of the uterine axis.

In discussing the causation of the great majority of "gynæcological backaches," Dr. Dougal states that he holds that the great majority are due to certain muscles becoming fatigued as a result of the extra strain thrown upon them. The muscles are normally protected from undue strain by the strong fibro-muscular tissue of the parametrium, but when that barrier is weakened by stretching or by the weight of a large uterus or tumour they may become fatigued and cause aching pain in the back. Dr. Dougal states that fatigue occurs more readily in some individuals than in others and that this depends on the state of the nervous system. Pain may sometimes be due to irritation of the sensory nerves which serve the pelvic viscera and are contained in the sympathetic system.

The first question to be considered in discussing Dr. Dougal's communication is whether he is justified in trying to find a common factor for such a symptom as backache. Backache is only referred pain and may be due to a great many different causes. The mental attitude of the patient, moreover, has a considerable bearing on the subject. Dr. Dougal shows, however, that careful diagnosis is necessary and that too much must not be expected from surgical operation. His experience is that when there is definite indicaton for operation the backache can be cured or relieved in over 70% of cases.

[1] *The Lancet*, December 13, 1924.

Abstracts from Current Medical Literature.

MORPHOLOGY.

Protection of Joints.

E. JOYCE PARTRIDGE (*Journal of Anatomy*, July, 1924) draws attention to the fact that ligaments would more often suffer strain were they the only protectors of the joint from dislocation and, although the tone of muscles is regarded as safeguarding joints, normal muscles are not so arranged that their tone is adequate to protect joints from injury in ordinary circumstances. The muscles supplied by a nerve act on the same surface of the joint as that supplied by the nerve and when a muscle such as the gracilis acts on a joint already well supplied with nerves, such as the knee joint, the motor nerve of the muscle, even though remote from the joint, will send a branch to the surface of the joint acted on by the muscle. Hence the obturator nerve supplies a branch to the medial aspect of the knee. This is practically Hilton's law as stated in 1887, but it may be extended as follows: In cases in which structures other than the joint are in danger from excessive muscular activity (as teeth and tongue in mastication) all the structures involved are supplied by the same nerve. Hence when a joint or other structure is endangered, the shortest possible path is provided for a reflex which shall cause contraction of the appropriate muscle and so relieve the ligament of any strain before the tension has become excessive. In paralytic dislocation of a joint one or more of the muscles to the joint are paralysed and the protection of the joint by reflex contraction of those muscles is absent. In Charcot's disease the sensory side of the reflex arc is lost and this leads to repeated assaults upon the joint by over-stretching of the capsule and ligaments and so synovitis, disorganization and frequent dislocation result. In other words, Charcot's disease is what would happen to all joints if they had to depend on their bony contour, their ligaments and the support of the muscles instead of the reflex protection just described.

Mechanical Factors and the Cœliac Artery.

J. WILLIAM BREMER (*American Journal of Anatomy*, September 15, 1924) shows that the position of the cœliac artery in the embryo chick or turtle may be determined by mechanical factors. The cœliac and vitelline arteries in the chick arise from the right dorso-lateral wall of the dorsal aorta, those of the turtle from the left lateral wall of the left aorta above the aortic fusion, though in each case the arteries originated as median ventral branches of the single aorta. In each case the roots of the arteries are encircled and held by a plexus of sympathetic fibres, connected with the ganglionic chain and thus with the thoracic nerves and the arteries have been pulled into their later position by the nerves. In the turtle the single aorta actually splits into its right and left original components for the distance of two or three somites and the ventral branches are carried on the left component. A nerve plexus which has recently completed the peri-aortic ring and engaged the vessels, is thus torn apart and the pre-aortic plexus remains attached to the left side only. The aorta is then separated further from the vertebral column by the growth and action of the large retractor muscles which cause a tension on the nerves and arteries, thus drawing the latter to their lateral position. In the chick a spiral curve of the cervical region results from the rotation of the head and moves caudally as the head grows and the neck bend becomes established. At the curve the structures are symmetrical, the aorta to the right of the spinal cord, as is seen when true transverse sections of this level are studied. The curve is at the level of the upper thoracic nerves at the time when the sympathetic fibres reach and encircle the root of the cœliac artery and because of the shorter distance from the spinal cord, the right fibres arrive first at this goal. The retraction of the primary sympathetic chain to a more dorsal position follows immediately and the right sympathetic plexus carries with it the root of the artery to a dorso-lateral position. The curious position of the artery in both turtle and chick is thus due to mechanical forces, the by-products of developmental changes in the embryo concerned.

Experimental Work on the Testis.

CARL R. MOORE AND W. J. QUICK (*American Journal of Anatomy*, November 15, 1924) give the results of a series of experiments on the testis of the guinea-pig and the rabbit. The testes of guinea-pigs were confined in the abdominal cavity for varying periods by retraction of the organ through the inguinal canal, with or without closure of the latter. Blood supply, nerve connexions and *vas deferens* retained their normal connexions. Retention in the peritoneal cavity for seven days resulted in complete disorganization of the germinal epithelium of the seminiferous tubules. After twenty days only the Sertoli reticulum and a few spermatogonia remain. No recovery occurs whilst the testis is retained in the abdomen, but if replaced in the scrotum recovery will occur. The cause of testicular degeneration on removal to the peritoneal cavity is due to the higher temperature in that position. The effect of heat in causing degeneration was demonstrated by the application of warm water to the surface of the scrotum or warm normal saline solution direct to the testes. Continuous applications were more effective than intermittent (daily) applications. Ten minutes' application of water at 47° C. to the scrotal surface caused definite degeneration of part of the testes, the deeper portions remaining almost normal. Hence it was concluded that the scrotum acts as an indispensible local thermo-regulator to maintain the testis at the optimum temperature for spermatogenesis. Occlusion of the *vas deferens* in the rabbit did not lead to degeneration of the germinal epithelium of the testis at any time up to six months afterwards. Peritoneal retention of the active adult rabbit testis caused degeneration just as in the guinea-pig. Occlusion of the *vas deferens* did not result in the formation of cysts at the free end, but caused the epididymis to increase by two to three times the normal size and this increase may cause displacement of the testes into the inguinal canal and so a partial degeneration due to the raised temperature (not to the occluded vas). Hypertrophy of the interstitial cells does not follow vasectomy in the rabbit. In the guinea-pig after degeneration of the germinal epithelium, due to placing the testes in the peritoneal cavity, the interstitial cells increase, but the interstitial cell reaction is not increased and so no true compensatory hypertrophy can have occurred.

Dark-Field Microscope and Fat Assimilation.

S. H. GAGE AND P. A. FISH (*American Journal of Anatomy*, September 15, 1924) show that by the use of dyes such as Sudan III. and the dark-field microscope fat may be traced from its absorption to its deposition in the tissues or its secretion as fat in milk or in the yolk of eggs. When stained fat is given it is possible to detect its presence as minute stained droplets (chylomicrons) in the blood within from a half to one and a half hours of eating the fatty food. These minute droplets as revealed by the dark-field microscope are from 0.5 to 1.0 μ in diameter. By means of the method many problems of physiological interest may be approached. In rats, cats and dogs the pink fat is first laid down as adipose tissue in the peri-renal fat, in the omentum and in the mesentery. It last appears in the popliteal, orbital and epidural fat masses. Successive feedings of coloured fat to the domestic hen results in eggs of which the yolk is formed of successive pink rings. (The time required for the development of the eggs may thus be ascertained.) The fat was found to be absorbed from the alimentary canal in the region of the middle of the small intestine; but when large quantities were given the first part of the large intestine was also active.

Attrition in the Human Body.

A. W. MEYER (*American Journal of Anatomy*, September 15, 1924) brings forward evidence to show the effects of attrition in various situations in the human body. The wear of teeth and the effects of friction on the skin are well known and the author suggests that similar effects must occur

internally. Thus the small flakes of cartilage to be found in synovia must have resulted from abrasion of the joint surfaces. Bursæ may show a slight furring of the internal surfaces. Tendons may become frayed. Many examples are given by the author and it is suggested that what is usually described as the congenital absence of the long head of the biceps and other related phenomena, may be really the result of wear and not a congenital defect.

Study of Living Tissues.

J. C. SANDISON (*Anatomical Record*, September 25, 1924) describes a new method for the study of living mammalian tissues. A rabbit was used for the experiment and a transparent chamber composed of two layers of isinglass separated by a fragment of a number I. cover glass being cemented between them, was inserted into the ear. Glass chambers were found too brittle. To prevent the inclusion of air between the isinglass the space was filled with normal saline solution. Aseptic precautions were observed. For the utilization of the preparation the rabbit is bound down and the ear with its window placed on the stage in a similar manner to that used with the web of a frog's foot. Growing tissues infiltrate between the layers of isinglass and the processes of growth may be watched. Such chambers have been kept in position for one to eight weeks.

MORBID ANATOMY.

Leuco-Sarcomatosis of Sternberg.

S. I. DE JONG AND LOVET (*Bullétin de l'Association Française pour l'Étude du Cancer*, February, 1924) report an example of acute leuchæmia with an atypical latent lympho-cytoma of the mediastinum in a girl seventeen years old. The account is regarded as having a double interest. In the first place it is interesting from the clinical standpoint because of the absolute latence of an enormous mediastinal tumour; in the second place it belongs to that very rare group of cases in which a tumour of the hæmatopoïetic tissue is accompanied, at least during the last days of life, by a typical syndrome of acute leuchæmia.

Tumours of the Uterus in Mice.

MAUDE SLYE, HARRIET F. HOLMES AND H. GIDEON WELLS (*The Journal of Cancer Research*, April, 1924) contribute a paper on primary spontaneous tumours of the uterus in mice with a review of the comparative pathology of uterine neoplasms. They emphasize the great infrequency of such growths in all the lower mammals, as contrasted with the high incidence in man and even in proportion to the occurrence of tumours in other sites in the lower mammals. This is particularly noteworthy in view of the great frequency of mammary gland carcinoma in some species and of ovarian tumours in other animals. Of all lower animals uterine cancer is least rare in cows, but even in this species it is far from common and constitutes but a small proportion of all the bovine neoplasms. Even in dogs, susceptible as they are to tumour formation, uterine carcinomata are almost unknown. Only in rabbits are the records of uterine tumours at all numerous and this because one observer (Stilling) had thirteen examples in a single strain of rabbits under his observation, a fact supporting the author's experience that heredity may determine not only the frequency but also the site and character of tumour formation. In mice but few uterine tumours have been described. They are very rare in the Slye stock, for in 39,000 autopsies in only twenty-two animals were unquestionably primary uterine tumours present. Of these, eleven were leio-myomata, seven sarcomata, three adenomata and one a teratoma. Two of the adenomata were of the diffuse infiltrating type. The entire uterine wall was diffusely infiltrated by a growth of typical tubules which were abundantly distributed through the muscular coat and even under the serosa. In these, however, the character of the tubules resembled more a benign adenomatous growth than a carcinoma, despite the abundant infiltration of the uterine wall. Both of these mice had borne young, but not recently before death. These two specimens resemble in some respects the uterine adeno-myomata described by Cullen, especially in respect to the normal appearing glands and the typical submucous connective tissue about the tubules. They differ, however, in not manifesting any myomatous character and in the more diffuse infiltration, all parts of the uterus being invaded and many tubules being present beneath the serous surface, a condition not described in the usual human adenomyomata. So widespread is this glandular infiltration that it cannot be certain that these growths are not malignant. The lack of extension outside the uterus and the preservation of the relation of epithelial structure to specialized submucous connective tissue, however, are strong evidences against malignant disease.

Cancerous Heredity in the Mouse.

A. DE COULON AND L. BOEZ (*Bullétin de l'Association Française pour l'Étude du Cancer*, June, 1924) say that numerous authors have studied heredity in cancer. Fyzzer and Bashford and Murray found that the hereditary factor plays a preponderating part in the transmission of this disease. In recent years Miss Slye has taken up this question again and she has arrived at the conclusion that cancerous heredity in the mouse is indisputable. This heredity would even appear to be specific as to the histological type of the tumour. The authors possess at the Institut d'Hygiène de Strasbourg an important breed of mice, most of the ancestors of which came from the Pasteur Institute of Paris, the remainder from Parisian breeders. In September, 1921, the authors isolated a pregnant female with a spontaneous tumour of the breast. Immediately after birth the offspring of the cancerous mother were separated and suckled by a non-cancerous female and the offspring of the latter were suckled by the cancerous mouse. This was done to eliminate the hypothetical factor of contagion from animal to animal. Only the young of the cancerous mouse reared by the non-cancerous mouse survived. The cancerous mouse on account of its cachectic state, did not succeed in rearing the young that were entrusted to it. Exactly the same procedure was carried out in July, 1922, with the litter of another cancerous mouse. The descendants of these two cancerous mice were crossed with one another and careful observation of the offspring was carried out. The authors found that the descendants of cancerous mice obtained by crossing mice that have been born of cancerous mothers and reared by non-cancerous mice, do not manifest a percentage of spontaneous tumours greater than that of a normal strain.

The Action of X-Rays on Spontaneous Tumours in the Mouse.

J. B. MURPHY, J. MAISIN AND E. STURM (*Bullétin de l'Association Française pour l'Étude du Cancer*, February, 1924) contribute an article on the mechanism of the action of X-rays on the development of spontaneous tumours in the mouse. Recent researches tend to prove that cancer cells are not as sensitive to radiation as early observers believed. Most carefully conducted experiments show that the dose that kills cancer cells, is rarely or perhaps never within the limits of the therapeutic dose applicable to man. On the other hand, it is indisputable that certain forms of cancer disappear under the action of X-rays. The authors found that auto-grafts coming from spontaneous tumours in the mouse in the majority of cases do not grow, if they are implanted into cutaneous zones that have previously received an erythematous dose of X-rays, whilst the same grafts in the majority of cases grow if they are inoculated into a place that has not been exposed to X-rays. They also found that autografts of spontaneous cancer well established and growing in the skin disappear in 76% of cases after the tumours and the surrounding tissues have been exposed to an erythematous dose of X-rays, whilst other autografts of the same origin which have received the same dose of rays outside the body (*in vitro*), when reimplanted in the same animals grow progressively in 96% of cases. Now this result is not due to a greater susceptibility of the cancer cells when irradiated *in situ*, because tumours irradiated *in situ* and reimplanted immediately afterwards in a non-irradiated area in the same animal develope actively. It is evident that in this instance the rays caused no direct alteration of the cancer cells.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held on November 27, 1924, at the B.M.A. Building, 30-34, Elizabeth Street, Sydney, DR. ANDREW DAVIDSON, the President, in the chair.

Enlargement of the Abdomen in Children.

PROFESSOR A. E. MILLS read a paper entitled: "Some Effects of Disturbance of Physiology of Movements of Gastro-Intestinal Tube" (see page 127).

DR. R. B. WADE read a paper entitled: "Some Aspects of Enlargement of the Abdomen in Children from the Surgical Point of View" (see page 131).

DR. L. R. PARKER, after congratulating the two speakers on their useful and clear exposition of the subject, dealt with the question of congenital hypertrophy of the pylorus. He stated that the symptoms always came on three to five weeks after birth. In these circumstances it was difficult to understand how the condition could be truly congenital. There was always this early period during which the infant was comfortable and manifested no signs of any hypertrophy of the pyloric end of the stomach. Again he pointed out that many of these children recovered completely and regained normal digestive functions after a time. At Greycliff, for instance, they saw a considerable number of infants with stenosis who became quite normal within a reasonable time without operation. Whereas, if a true organic hypertrophy existed he would expect that the disability would be more permanent. They had not lost one patient from pyloric stenosis as far as he could recollect. The patients usually had symptoms for from three to four months. He instanced the recent illness of a child at Greycliff, who had had typical signs and symptoms of pyloric stenosis, including vomiting, visible peristalsis and epigastric tumour. The stenotic condition had lasted for three months, at which time the child had contracted a subacute enteritis. When it had recovered from the enteritis, all signs of pyloric stenosis had disappeared. Dr. Wade had told them that in his opinion children who suffered from this condition and who were not treated surgically, were handicapped in after life. This was not his experience. He had seen many patients at varying times after discharge from Greycliff and many of these children had developed into very fine specimens of humanity. One girl in particular was one of the most perfect specimens of childhood he had ever seen.

DR. J. FLYNN stated that everyone would admit that Professor Mills's address was an able *résumé* of a rather difficult subject. Reviewing the address as a friendly critic, not as a critical friend, he thought it was a pity that he had not included Keith's researches on Auerbach's tissue, that intermediate tissue between non-striated muscle and the sympathetic nerve tissue. It was this intermediate tissue which was particularly endowed with an automatic power of originating contractile impulses and muscular movements. This, the most excitable musculature of the intestine, was to be found in those parts of the bowel in which tonicity was well developed, such as the pylorus, the terminal part of the ileum and the descending colon. Professor Keith was of opinion that in the condition called "intestinal stasis" the symptoms did not result from atony of the musculature of the bowel, but from a hypertonicity of those parts which were normally in a state of tonic contraction. He divided the alimentary canal into six or seven regions, each, as it were, controlled by special nodal tissue where impulses were collected and correlated. Failure of coordination was probably the cause of Hirschsprung's disease or so-called idiopathic dilatation of the colon. The condition was therefore similar to pyloro-spasm or cardio-spasm at the cardiac orifice or stasis at the ileo-caecal valve. In his opinion these points, omitted through inadvertence, if included by Professor Mills would have enabled him to tread on relatively firm ground. Everyone present was pleased not only with the address, but with the inimitable manner in which it had been presented.

DR. R. B. MONSON also congratulated the readers of the papers. In the first place he turned his attention to Professor Mills's suggestion that pyloric stenosis was a disturbance of spastic tonus. It appeared to him that the sympathetic innervation of muscles maintaining tonus represented rather a new condition in medical ideas. Like many other new fashions in medicine, there was a danger of running this idea to death. He did not think that pyloric stenosis was parallel to spastic paraplegia or that the work that Royle and Hunter had done, could be applied to this condition. He wished to draw attention to some admirable investigations which had been carried out in England by Beckwith, Whitehouse and Featherstone. They had demonstrated that the longitudinal and the circular muscular fibres of the uterus had distinct nervous mechanism. They had shown that the longitudinal muscles derived their nerve supply from the spinal nerves, while the circular muscles were innervated from the sympathetic ganglia. He, the speaker, had noticed when performing Cæsarean section under spinal anæsthesia that the circular muscular fibres went into contraction, but not the longitudinal fibres. The spinal anæsthesia cut off the nerve supply coming from the cord, but did not interfere with sympathetic innervation. The suggestion was made that there was a sympathetic contraction of the circular muscles and the simultaneous inhibition of the longitudinal muscles. In high spinal anæsthesia the intestines appeared blanched and white. He regarded this as evidence of contraction of the circular fibres which were innervated by the sympathetic. The inhibition of the longitudinal fibres was probably a sympathetic phenomenon. He thought that this would explain to some extent the symptoms of many of these abdominal conditions. He thought that no doubt Professor Mills had given careful thought to his suggestion and would be able to find other evidence in support of it.

DR. H. C. RUTHERFORD DARLING expressed the opinion that Professor Mills's views had cleared up many points of doubt in connexion with gastric and abdominal surgery in children. He was satisfied that there would be many more leaks into the abdominal cavity after incision of the stomach and other hollow viscera if it were not for the inhibitory action referred to by Professor Mills. Dr. Darling spoke of *caecum mobile*, by no means a rare condition, in particular regard to its causation. It was frequently diagnosed as chronic appendicitis and at times appeared to be dependent upon pathological conditions in the ascending colon. *Caecum mobile* was compatible with perfect health and could exist without giving rise to symptoms. Symptoms occurred at times when the normal tension on the mesentery was increased either by a diminution of the natural intrinsic supports of the viscus or by an abnormal overloading of a viscus whose intrinsic supports were intact. Abnormal tension on the mesentery gave rise to inhibition of the ileo-caecal angle of three kinds. There was inhibition of the ileal peristalsis, there was spasm of the ileo-caecal valve and there was inhibition of the ileo-caecal node. In this connexion he discussed the mechanism of intussusception. If the ascending colon were not abnormally mobile, it would be impossible for an intussusception to pass as far as the descending colon. Dr. Darling further expressed the view that Hirschsprung's disease was a reflex condition. In regard to stenosis of the pylorus he had been very interested in Dr. Monson's remarks. At times there was enormous hypertrophy of the circular muscle fibres throughout the stomach. Nevertheless, this condition was often cured by medical means.

DR. KEVIN BYRNE spoke of the danger of dogmatism in diagnosis. He referred to an infant who suffered from convulsions which were apparently due to intestinal trouble. The condition was treated by washing out the stomach and clearing the bowel and all seemed well. A couple of weeks later a mass had appeared in the abdomen. This had been diagnosed by one surgeon as sarcoma of the kidney. The patient had been seen by another surgeon, who had opened the abdomen and had found the bowels matted together. A condition of chronic intussusception was present. Dr. Byrne held that the practitioner should

take into consideration in these intestinal troubles the possibility of a sub-acute intussusception and exercise great care in arriving at a diagnosis He was sure that intussusception was frequently not diagnosed because the affection did not pass into the acute stage.

DR. P. L. HIPSLEY referred to a patient whom he had treated a few months previously. He had operated upon this child for pyloric stenosis ten years before. While carrying out an appendicectomy he took the opportunity to examine the stomach and had been interested in finding that there was still some hypertrophy of the pylorus even after ten years; the food was leaving the stomach through the new stoma. A few years previously, while performing *post mortem* examinations on infants, he had endeavoured to ascertain whether hypertrophy sometimes existed without stenosis. He had found that it was not uncommon. He held that this was probably a congenital anomaly and he was prepared to believe that Dr. Flynn's explanation was a correct one.

He asked Professor Mills whether he could offer an explanation for the common experience that intussusception affected almost exclusively healthy infants. He had rarely seen it in unhealthy babies. It seemed to him to be surprising that intussusception was not more common, if the theory of irregular peristalsis were correct.

Dr. Wade had spoken of three possible sources of the infection in pneumococcal peritonitis. He had not mentioned the appendix as a source of infection. He related the details of a case of a child with a localized pneumococcal abscess around the appendix which was obviously diseased and presumably the cause of the abscess.

DR. ANDREW DAVIDSON congratulated the two speakers and expressed the opinion that the paper Professor Mills had read had given them cause for serious thought for some time to come. Dr. Wade's paper had been very valuable from a practical point of view.

In his reply, Professor Mills said that the members had been too gentle in their criticism. He had suggested that a disturbance of the spastic tonus of the intestine might be an explanation of lesions like intussusception and had expected to have been overwhelmed with critical opposition. He congratulated Dr. Parker on his admirable results. In regard to the congenital nature of some of these affections, he maintained that some of the congenital abnormalities actually caused trouble. Children were not all built according to the same standard. They were too apt to regard people as being standardized and as being comprised of replaceable parts. There were many varieties of infants. But that did not explain why a child appeared to be perfectly well for three or four weeks before manifestations of pyloric stenosis appeared. Arthur Keith had taught that the nodal tissue of the cœliac ganglia was analagous to the nodal tissue of the heart. In both regions atrophy of the muscular tissue and degeneration occurred. A failure of the nodal tissue necessarily lead to a physiological disturbance. The law of the intestine was upset in locomotor ataxia and in other lesions of the nervous system.

He was unable to offer any explanation of the hypertrophy in Hirschsprung's disease. It was difficult to explain why block occurred in this condition. He still maintained that there was a disturbance of the law of the intestine. The increase of the muscular tissue of the pylorus was not limited to that part. It was detectable elsewhere. He reminded members of the condition of the œsophagus in functional stenosis. Mercury could be poured through the functional stricture and there was a certain amount of hypertrophy which was not necessary to meet the increased demand for work. While he thought that a loss of spastic tonus was present in Hirschsprung's disease, he realized that this was merely a suggestion; that there was a disturbance of the law of the intestine was certain.

In reply to Dr. Monson, Professor Mills said that all muscle had a double innervation. After discussing the differences of the spinal and sympathetic ganglia, he claimed that there was no evidence to support the suggestion that there would be a different innervation in one set of muscular fibres, the circular as compared with another, the longitudinal. He was satisfied that the double innervation existed in all parts of the muscle and that it was not correct to assume the one set of fibres received sympathetic and its neighbour spinal innervation. He thought that it was possible to explain the blanching of the intestine after spinal analgesia without invoking Dr. Monson's hypothesis. In intestinal toxæmia dilatation occurred, but this was not due to forces within the intestine. When toxæmia was associated with stasis, the condition was partly due to atrophy of Auerbach's plexus.

Dr. Wade agreed with Dr. Parker that infants during the first three or four weeks of life before manifesting the signs of pyloric stenosis, were quite normal. He had no explanation to offer, but he would point out that after the symptoms appeared, some of these patients had periods of relaxation during which they were apparently quite well, while others had symptoms the whole time. He congratulated Dr. Parker on his extraordinarily good results. He was interested in listening to Dr. Hipsley's account of his *post mortem* investigations. The hypertrophied or thickened pylorus certainly persisted after cure. He had seen several children who had got quite well without operation. Usually they had recurrent attacks with increasing intervals and eventually they regained apparently normal digestion. He agreed with Dr. Hipsley that it was possible that the appendix might be the source of a pneumococcal peritonitis. He had seen an instance of this. There was, however, always a difficulty in determining which was the primary, the appendiceal or the peritoneal infection.

MEDICO-POLITICAL.

THE following have been appointed office-bearers and members of committees of the Council of the Victorian Branch of the British Medical Association:

President: Dr. Stanley Argyle, M.L.A.

Vice-Presidents: Dr. H. Douglas Stephens and Dr. R. J. Bull.

Honorary Secretary: Dr. F. L. Davies.

Honorary Treasurer: Dr. C. H. Mollison.

Honorary Librarians: Dr. W. G. D. Upjohn and Dr. R. H. Fetherston.

Chairman of Committees: Dr. J. Newman Morris.

Representative on the Representative Body: Dr. J. P. Major.

Delegate at the Annual Meeting of the Association: Dr. W. S. Newton.

Dr. J. Harris, Dr. C. L. Park and Dr. Allen Robertson have been coopted by the Council as members under Rule VIII.

Dr. P. V. Langmore has been elected a member of the Council representing the South-Eastern Division, Dr. F. J. Bonnin representing the North-Western Division and Dr. T. C. Ker as representing the Northern Division.

Organization Sub-Committee.—Dr. Allen Robertson, Dr. J. H. Pestell, Dr. F. E. McAree, Dr. B. M. Sutherland, Dr. J. F. Wilkinson, Dr. John Gordon, Dr. Walter Summons, Dr. C. L. Park, Dr. David Rosenberg, Dr. J. W. Dunbar Hooper and Dr. G. Weigall.

Ethical Sub-Committee.—Dr. J. W. Dunbar Hooper (convener), Dr. A. V. M. Anderson, Dr. L. S. Latham, Dr. Fay Maclure, Dr. Alan Newton, Dr. B. M. Sutherland, Sir George Syme, Dr. Walter Summons and Dr. W. G. D. Upjohn.

Legislative Sub-Committee.—Dr. Victor Hurley, Dr. R. M. Downes, Dr. R. H. Fetherston, Dr. B. T. Zwar, Dr. J. R. Harris, Dr. C. L. Park, Dr. W. S. Newton, Sir George Syme, Dr A. L. Kenny and Dr. David Rosenberg.

House Sub-Committee.—Dr. C. H. Mollison and Dr. R. H. Fetherston.

Scientific Sub-Committee.—Dr. R. Fowler (convener), Dr. K. Hiller, Dr. Victor Hurley, Dr. Alan Newton, Dr. W. G. D. Upjohn, Dr. A. E. R. White, Dr. Fay Maclure, Dr. C. H. Kellaway and Dr. J. W. Dunbar Hooper.

Medical Agency Sub-Committee.—Dr. W. Kent Hughes, Dr. R. M. Downes, Dr. C. H. Mollison, Dr. W. G. D. Upjohn and Dr. R. H. Fetherston.

Building Sub-Committee.—Dr. J. W. Dunbar Hooper, Dr. R. H. Fetherston, Dr. W. Kent Hughes, Dr. C. H. Mollison, Dr. J. F. Wilkinson, Dr. B. T. Zwar and Dr. C. L. Park.

Library Sub-Committee.—Dr. W. G. D. Upjohn and Dr. R. H. Fetherston.

National Insurance Sub-Committee.—Dr. J. N. Morris, Dr. J. Ramsay Webb, Dr. W. R. Boyd, Dr. R. H. Fetherston, Dr. W. G. D. Upjohn, Dr. David Rosenberg, Sir George Syme and Organization Committee with power to coopt.

Obstetric Sub-Committee.—Dr. R. Fowler, Dr. J. W. Dunbar Hooper, Dr. B. T. Zwar, Dr. E. B. Heffernan, Dr. H. C. Lloyd, Dr. A. M. Wilson, Dr. J. Ramsay Webb, Dr. B. M. Sutherland and Dr. Margaret McLorinan.

Advisory Board to Medical Inspectors of Schools.—Dr. B. T. Zwar.

Victorian Correspondent of "The British Medical Journal."—Dr. Reginald Webster.

Permanent Post-Graduate Committee.—Dr. J. W. Dunbar Hooper and Dr. A. V. M. Anderson.

Bush Nursing Association.—Dr. B. T. Zwar and Dr. B. M. Sutherland.

Free Kindergarten Union.—Dr. W. Kent Hughes.

Society for Combating Venereal Disease.—Sir George Syme, Dr. Fay Maclure, Dr. J. W. Dunbar Hooper, Dr. R. H. Fetherston, Dr. C. L. Park, Dr. R. Fowler and Dr. G. Weigall.

Baby Health Centres.—Dr. W. G. D. Upjohn and Dr. R. M. Downes.

Executive of Melbourne University Association.—Dr. W. G. D. Upjohn.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been elected a member of the Queensland Branch of the British Medical Association:

Bolton, George A., M.B., Ch.M., 1924 (Univ. Sydney), "Leyton," Hill Street, Wooloowin.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Miskle, Clarence Patrick, M.B., Ch.M., 1924 (Univ. Sydney), Lue.

Riley, Bernard Morton Birkenhead, M.B., Ch.M., 1923 (Univ. Sydney), Royal North Shore Hospital of Sydney.

NOTICES.

A MEETING of the Section of Surgery of the New South Wales Branch of the British Medical Association will be held at the B.M.A. Building, 30-34, Elizabeth Street, Sydney, on February 29, 1925. Dr. H. R. G. Poate and Dr. J. L. McKelvey will read papers on the symptoms of intestinal obstruction.

Medical Societies.

THE ALFRED HOSPITAL CLINICAL SOCIETY.

A MEETING OF THE ALFRED HOSPITAL CLINICAL SOCIETY was held at the Alfred Hospital, Melbourne, on September 30, 1924, DR. J. P. MAJOR, the President, in the chair.

Tumour of Testis.

DR. W. SUMMONS, O.B.E., showed a male, aged sixty-five years, with a scrotal swelling. The swelling was apparently largely solid and extended up into the inguinal canal. There was one fluctuating area in front. A swelling could be felt in the area of the left lumbar glands. Dr. Summons asked for suggestions as to diagnosis and treatment. The general opinion favoured sarcoma as a diagnosis.

MR. A. J. TRINCA pointed out that the nomenclature of testicular tumours was of interest. True sarcoma was very rare. Tumours were either carcinomata or teratomata as a rule. He laid stress on the fact that many testicles were removed which later were proved not to be the site of tumours, but of old hæmatoceles. All tumours should be explored before removal and in the case of the testis this could easily be done without danger.

Deformity of the Hand.

Mr. A. J. Trinca showed a male, who as an infant had had his left forearm and hand severely burnt. Amputation had been advised, but refused. Since growing up the patient had served in many capacities as labourer, stevedore and so forth and had always been able to earn a full wage. The man's hand was grotesquely deformed and at first sight appeared to be useless for any purpose.

Mr. Trinca showed the patient as a plea for the adoption of conservative measures in such cases.

Spina Bifida Occulta.

MR. HUGH TRUMBLE, M.C., showed a man, aged twenty-three years, who complained that for the past two years he had suffered from pain in the region of the lumbo-sacral articulation. He gave a history of indefinite injury to the back in 1916. On examination nothing abnormal was apparent except a fulness just below the fifth lumbar spine and an absence of bony resistance over the upper extremity of the sacrum in the middle line. A radiogram revealed no shadow suggesting the normal sacral spines in this area.

Mr. Trumble inclined to the opinion that the condition was one of *spina bifida occulta*.

DR. C. E. DENNIS thought that the X-ray photograph confirmed this view. Suggestions as to treatment were not forthcoming.

Skiagrams.

Dr. Dennis showed several X-ray photographs of interest. A shadow in the gall bladder area which appeared to be caused by one large gall stone, had been shown at operation to be caused by a collection of about eighty small stones. Several plates of the skull were demonstrated.

Hæmoptysis.

DR. ELLIS GILLESPIE showed a boy, aged twelve years, who gave a history of spitting up blood during the preceding five weeks. The blood was stated to be dark and thick, not frothy. He had not coughed up blood, but had vomited it on several occasions. Two weeks previously he had brought up a considerable quantity of dark blood.

The patient complained of constant pain across the upper part of the abdomen. The pain extended into the chest and was always worse just before blood appeared. He had abdominal pain immediately after every meal, lasting only a short time and generally worse after the mid-day meal. He had been perfectly well prior to the hæmoptysis. Latterly he had been expectorating bright, watery, blood-stained sputum and at times blood had run from the mouth during sleep.

Physical examination disclosed no abnormality. X-ray examination revealed no abnormality in the gastro-intestinal tract. It had been seen by X-ray examination that the diaphragm was high on both sides. The right hilus shadows were "*plus plus*." Cloudiness was present from clavicle to base. There was faint mottled shading of the right apex. This extended from the right hilus towards the periphery and suggested early infection of the hilum, peri-hilar region and right apex.

The serum had not reacted to the Wassermann test. A "+ +" reaction had been obtained to the von Pirquet test with bovine and a "+" reaction with human type. The blood film had been normal.

Examination of nose and throat had revealed no abnormality.

The patient looked perfectly well and on the whole felt quite well, but was still spitting up blood.

DR. SPALDING LAURIE did not think the hæmorrhage was from the lungs.

MR. BALCOMBE QUICK discussed the possibility of the presence of pulmonary hydatid and recalled a somewhat similar case.

Pontine Thrombosis.

DR. HENRY LAURIE also showed a man, aged forty-eight, a poultry farmer, who complained of feeling of pins and needles all down the left side.

The patient had been quite well until about ten years previously. His illness had started with pains in the back, which were referred down the legs. He had been in Melbourne Hospital two years previously with renal colic, at which time he passed a stone. Since then he had had nocturnal frequency. One year previously while working, he had a sudden loss of power in the right hand, accompanied by a "queer" sensation. A few minutes later he had noticed that he had lost power in his right leg and could not walk. Since then these symptoms had improved and he dragged his legs only slightly. Four weeks previously he had again felt "queer." Soon after this he had sensation of an acute pain all down the left side associated with hyper-sensitiveness.

Examination at the time of demonstration revealed that the pupils were almost pin point, but reacted slightly to light. Other general examination revealed a large mass in the right side of the abdomen which moved well on respiration and seemed to be continuous with the liver.

Ophthalmoscopic examination revealed large hæmorrhagic exudates, arterio-sclerotic changes in the vessels and prominence of the discs.

There was definite paresis of the muscles of the left eye. Some slight paresis of the left side of the face was present. The tongue deviated to the right side and there was weakness in the left arm and in both legs.

Superficial abdominal reflexes were absent on the left side and all other deep reflexes were increased. Ankle and patellar clonus were present on both sides. Some rigidity was noted in both legs especially the left. The plantar reflex on the left side was possibly of the extension type.

Dr. Laurie pointed out that light touch was more acutely felt on the left side. The hyperæsthesia was especially noticeable in the legs and foot and on the left side more than the right.

Heat and cold could not be distinguished in the left leg up to the goin. Heat was more poorly distinguished than cold. The right limb was insensitive to heat and cold in the foot and lower part of the leg only.

The blood urea was two hundred milligrammes per one hundred cubic centimetres. The systolic blood pressure was two hundred and twenty millimetres of mercury and the diastolic one hundred and twenty millimetres.

The results of the urea concentration test had been 0.515%, 0.8% and 0.85%.

Cerebral Tumour.

Dr. Henry Laurie also showed a woman, aged thirty-four. She had complained of headache and vomiting for the previous three weeks. She had had no previous illnesses except puerperal septicæmia four and a half years previously.

She had been quite well until three years previously, when occipital headache had been accompanied in a few hours by ringing in the right ear. Two days later she had vomited frequently and at the time of demonstration was deaf in the right ear. At about that time she had noticed that her sight was not good. Occasionally she had had double vision, headache had also been very severe. Since then it had been noticed that the eye-lids twitched at various times and the sight was getting progressively worse. She fell towards the right side when she started to walk.

Dr. Laurie pointed out that the pupils were unequal. The right was slightly larger than the left. Both reacted well. Definite papillœdema of both discs was present. There was paresis of the right external rectus, right facial paresis and deafness of the right ear.

All the general reflexes were equal and increased. The plantar reflex was flexor in type.

The abdominal reflexes were equal and increased. There was no change in sensibility.

The cerebro-spinal fluid was clear and had not been under increased pressure. The cell content normal and no globulin excess had been found. Total albumin in the cerebro-spinal fluid was 0.04. The sugar content was 0.06.

Dr. Foster had removed a plug of hard cerumen from the right ear. Hearing was acute and covered the whole length of the scale without gaps.

Nystagnus was readily produced on syringing with cold water. Thus neither the labyrinth nor auditory nerve was involved.

Obituary.

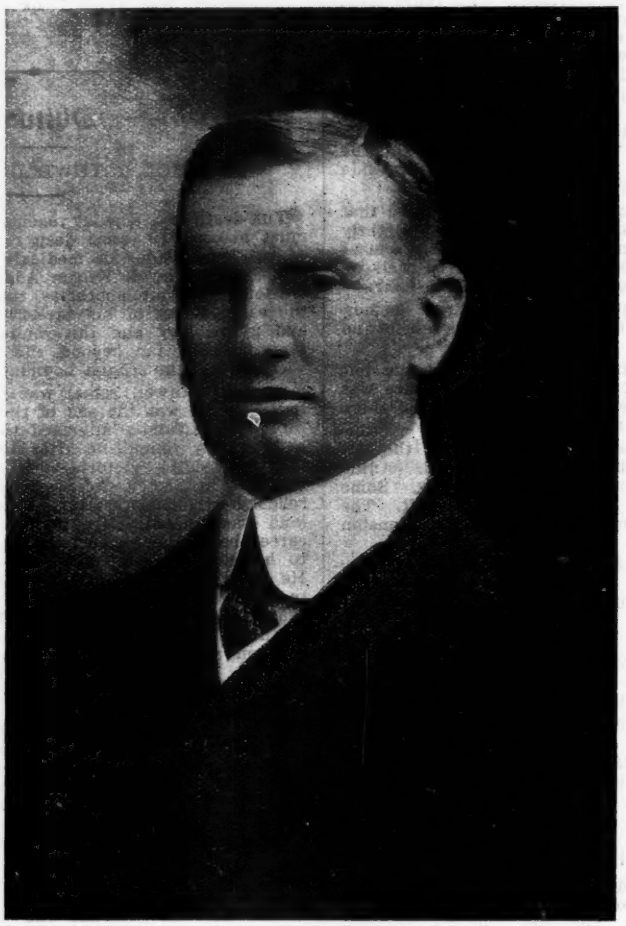
GEORGE ROTHWELL WILSON ADAM.

THE death of a popular teacher and an eminent clinician must necessarily cause deep regret among the members of two generations of medical practitioners. The death of George Rothwell Wilson Adam has touched three generations, his contemporaries, those who graduated during the early stages of his career as a teacher of obstetrics and gynæcology and the young doctors of to-day. His fame reached far beyond the confines of the State of Victoria and the seagirt boundaries of the Commonwealth.

George Rothwell Adam was born in Leeds, Yorkshire, in 1853. He was the son of the Reverend George Wilson Adam. The family migrated to New South Wales while he was very young and after a period of about ten years they moved to Victoria. George Rothwell Adam was educated at Scotch College in Melbourne. After leaving school he took up farming. It seems that the life on the land was not attractive to him, for he relinquished this career before he reached the age of twenty and returned to his homeland for the purpose of studying medicine. He entered the University of Edinburgh and graduated in the year 1877. His first resident appointment was that of house physician at the Edinburgh Maternity Hospital. In 1878 and 1879 he occupied the positions of house surgeon and house physician at the Glasgow Royal Infirmary. In 1880 he returned to Melbourne and started in practice in East Melbourne. He was appointed an assistant surgeon at the Alfred Hospital shortly after his arrival. In the early days of his practice he made full use of the valuable experience he had gained in Scotland in obstetrics and sought every opportunity to render himself especially proficient in this branch of medicine and in gynæcology. In 1887 he was elected an honorary obstetrician at the Women's Hospital, Melbourne. From that year until 1895 he worked assiduously and with characteristic energy in the obstetric department and was then appointed honorary gynæcological surgeon to the Hospital. His influence on the management of the institution was profound and he was during the thirty-six years until his retirement from the active staff, responsible for much of the progress and development of the obstetric and gynæcological practice. From 1913 until his death he was consulting surgeon to the Women's Hospital. His position entailed the teaching of obstetrics to the students of the University and as a teacher his success was very great. He was loved by students, patients and colleagues; his knowledge, judgement and skill were admired and envied. His lectures both on obstetrics and on gynæcology were patterns of excellence, logical, well elaborated and admirably delivered. He had the knack of keeping his audience interested and there were but few who did not enjoy as well as profit by them. His choice of expression, his clear argument and his convincing tone compelled the attention, admiration, respect and loyalty of all his students. His standard of practice was a high one and he imparted his knowledge in a manner calcu-

lated to make his pupils competent and reliable practitioners. His conception of ethics and the manner in which he applied the principles of correct ethical behaviour both in his professional and in his private life, were assets of incalculable value to them. He thus combined two unusual qualities, the great gift of clear understanding and the great gift of being able to impart knowledge.

In the days before the Victorian Branch of the British Medical Association and the Medical Society of Victoria became merged into one another, George Rothwell Adam secured the confidence of his contemporaries and was elected to the office of President of the Medical Society of Victoria. He was chosen to be President of the Section of Obstetrics and Gynæcology at the Australasian Medical Congress, Sydney, 1911. When the Melbourne Gynæcological and Obstetric Society was formed a few years ago, he became the first president.



In 1922 he was invited by the South Australian Branch of the British Medical Association to deliver the Listerian Oration. He chose the subject of the influence that Listerism exercises on obstetrics (THE MEDICAL JOURNAL OF AUSTRALIA, August 12, 1922, page 175). The oration is a masterly contribution to obstetric teaching and bears the stamp of a skilled and convincing writer. He ends in a typical manner by quoting Wordsworth's couplet:

"Come forth into the light of things,
Let Nature be your teacher!"

Recently the Branch has presented to each Listerian orator a medal. George Rothwell Adam valued his medal very highly.

Much more could be told of his career; the foregoing, together with the tributes by some of his colleagues which follow, will, however, suffice to place on record the opinions held by his contemporaries and those whom he taught, of Rothwell Adam, one of Australia's foremost obstetricians and gynæcologists.

DR. D. GRANT writes: The tragically sudden death of Rothwell Adam, occurring at a time when he was apparently in vigorous health, has been a painful shock to the medical profession as a whole and especially to those of us who were privileged to be his intimate friends. Among these I am able to count myself and also to remember with pride and satisfaction that our friendship had endured for a period of nearly forty years without interruption by the faintest cloud even of a passing misunderstanding.

Although we were in a sense contemporaries at Edinburgh during his student days, I cannot remember that I even met him during that time. There was a gap of two years between us academically speaking and during his last two years of studentship I had already left Edinburgh, so that we did not really begin to know each other until my arrival in Melbourne in the beginning of 1887. I then had a most cordial reception from him, which was followed by a long course of professional and friendly association, at first fairly frequent, more recently through the limitation of my active work somewhat rare.

Dr. Adam was a notable instance of the man who, having made what may be called a false start in life, has the insight to recognize the fact and the energy and determination to follow out a new course of a totally different kind. After some years spent in the country he entered on his medical course at the University of Edinburgh and took his degree in the ordinary course. This in itself is no small feat and the force of character indicated by it was the clue to his subsequent success in practice. His mind was not of the precocious and showy type which so often exhausts itself early and fails in any great accomplishment. Rather was it of the slowly maturing kind which goes on steadily acquiring knowledge and training judgement until the final product has something of the unerring quality of instinct. His investigations were patiently and carefully made, all the elements in any clinical problem brought before him were most judiciously balanced and the opinions resulting from the process were invariably characterized by that somewhat uncommon quality, common sense. Of his surgical accomplishments others better qualified than I am will probably speak and some of his former students will doubtless bear witness to his gifts as a teacher. But all will, I think, agree that as consultant and specialist, as teacher and as operator, he occupied a position of honour which was well earned.

Above and beyond all technical gifts and attainments must be reckoned those elements of character to which his eminent success was mainly due, namely absolute integrity, freedom from all selfish impulses in professional relations, energy and persistence in the acquisition of professional knowledge, a studious maintenance of a high standard of conduct and a scrupulous avoidance of all meretricious aids to success. He had his reward in the universal confidence accorded to him by all who knew him and the affectionate regard of those among them who could claim the title of friend.

DR. FELIX MEYER writes: The passing of George Rothwell Adam has brought to a close the life of one who helped to make history and traditions for the Women's Hospital of Melbourne and who set standards—ethical and scientific—in the teaching of obstetrics and gynæ-

cology. To have given whole-hearted service to a hospital for twenty-five years, to have crystallized the ever-increasing experience of hospital practice in his teaching is in the case of Rothwell Adam to have satisfied an ambition marked by a single mindedness of purpose as sane as it was sincere.

As one of his colleagues on the honorary staff throughout his connexion with the hospital and as his co-examiner during his lectureship at the University, my association with him was close and continuous; and from first to last it was for me—and I trust for him—a happy relation, undisturbed by a single discord. For the medical staff it was a pleasure to discuss with him hospital questions or matters of common interest; nor could it have been otherwise with a man who was singularly charitable in his judgements of humans, judicial in his consideration of evidence, judicious in his advice. And indeed there were many occasions when his advice was timely, when "to follow it were wisdom in the scorn of consequence."

As chairman of the staff he made effective use of his year of office. His task was not at all times an easy one, but his unfailing courtesy, his desire to be fair to all, his patience and understanding won from the staff an unqualified respect and regard. He was not given to demonstration; he kept his feelings well in hand. In all the years I knew him I do not remember him once losing his temper, nor do I recall his making an ungenerous criticism of a member of the profession. He had a dry humour of his own and could both tell and enjoy a good story. He was a kindly and hospitable host; an evening at his house, a chat over a pipe passed all too quickly.

As an examiner he tempered justice with mercy. He was quick to sum up a candidate's knowledge; he was a shrewd appraiser of values. He was insistent on the importance to the student of a sound obstetrical training and those whose privilege it was to attend his classes or his clinics, can bear witness to the care with which he prepared his lectures and the thoroughness with which he drove home the essentials of practice.

His aims and aspirations centred in his hospital and University work. To the excellence of that work the profession at large can testify. A hospital can give to a surgeon or a physician only so much as he brings to it and Rothwell Adam brought to his work all the qualities which made him the able and successful gynæcologist he was. His example and teaching have borne good fruit. He built better than he knew. *Ave atque vale.*

Dr. J. W. DUNBAR HOOPER writes: I desire to join with other Melbourne practitioners in giving expression to the high esteem in which the late Dr. Rothwell Adam was held among us.

From the day he commenced to teach obstetrics as a member of the honorary staff of the Women's Hospital one felt that Rothwell Adam was teaching from a ripe experience as a private practitioner. He had held the position of resident medical officer to the Maternity Hospital in Edinburgh, where he worked under Sir Halliday Croom and Dr. Milne Murray. These men inculcated in him the science and art of obstetrics.

He was one of the first of the honorary staff of the Women's Hospital to emphasize the "aseptic conscience"; he brought dignity and a sense of responsibility to his work and is very gratefully remembered by practitioners throughout the State of Victoria.

I do not think that Rothwell Adam ever made an enemy in the profession. He worked steadily and straight forwardly.

The last offices were attended by a large assemblage of medical men who had been his staunch friends for many years.

WILLIAM A. HASWELL.

GRADUATES of the University of Sydney and scientists throughout Australia learned with great regret of the death of Professor William A. Haswell which occurred at Sydney on January 24, 1924.

William Haswell was born in Edinburgh in 1854 and studied at Edinburgh University. He obtained the degrees of master of arts and doctor of science of that University. Coming to Australia in 1879, he was appointed curator of the Queensland National Museum. In 1882 he became demonstrator of zoology, comparative anatomy and histology at the University of Sydney and thus began a long and honourable association with that institution. In 1890 he was made professor of biology and held that position until the creation of the chair of botany in 1917. In this year he became professor of zoology. Later in the year he retired from active work.

William Haswell held a high position in the world of science. He was elected a fellow of the Royal Society of Great Britain in 1897 and was president of the Linnean Society of New South Wales in 1892 and 1893. He received the Clarke Memorial Medal of the Royal Society of New South Wales in 1915. His "Manual of Zoology" is well known and his "Text Book of Zoology" written in collaboration with T. Jeffrey Parker, is a standard work.

William Haswell is remembered by his old students as one who treated them with unfailing courtesy and helped them most by teaching them how to help themselves. His widow and daughter will have the sympathy of many who held him in affectionate regard.

Correspondence.

ABSCESS OF THE LUNG.

SIR: In the JOURNAL of December 20 Mr. Kent Hughes reports the case of an abscess of the lung due to a grass seed. The following case had a similar cause:

On November 9, 1924, a child was brought to me apparently in great pain and very sick. For over a week the child had a sore throat which was gradually getting worse. On examination the child had a large abscess in the soft palate. From its size it was impossible for the child to swallow and accounted for the child's difficulty in breathing.

I incised the abscess and evacuated a lot of pus. The wound was kept open by a piece of gauze. The child was brought back the next day and on examination I discovered a wild oat seed working out through the wound. After removal the condition quickly cleared up.

Yours, etc.,

THOS. G. SULLIVAN, M.B., B.S. (Melbourne).

Culgoa, Victoria,
December 22, 1924.

INTRA-CRANIAL HÆMORRHAGE IN THE NEWLY BORN.

SIR: I was interested in the case reported by Dr. Groves in the issue of December 20 and I think he will be interested in the cases of hæmorrhagic disease of the newborn treated by serum and reported by me on page 38 of July 8, 1922.

The following case treated similarly I do not consider can be fairly claimed as one of *melæna neonatorum*, inasmuch as the labour was a very prolonged one in a *primipara* and had to be terminated by forceps. The child, nine pounds in weight, was born at 1 p.m. on November 1, 1923, in a lethargic condition and took some rousing. Next morning about 9.30 a.m. the child had a convulsion and was reported to have had twitching of the face and limbs during the night. There were three convulsions before I saw it. Injection of two centimetres of "Hæmoplastin" without dilution was done subcutaneously in the abdominal wall. There were no subsequent convulsions and the child gradually recovered.

It would appear as if the serum helped in this almost certainly traumatic case and might be tried with benefit in other cases if opportunity offered.

Yours, etc.,

C. DUGUID.

192 North Terrace, Adelaide,
January 9, 1925.

A DOCTOR'S ENGAGEMENT BOOK.

EACH year Oppenheimer, Son & Company, Limited, of London, issue gratuitously to the members of the medical profession copies of their *"Ephemeris Pharmacologica."* We have been asked to announce that any medical practitioner who has not yet received a copy, can secure one on application to Messrs. Muir and Neil, De Mestre Place, George Street, Sydney. Much useful information is contained in this little volume.

Books Received.

A GLASGOW MANUAL OF OBSTETRICS, by Samuel J. Cameron, M.B. (Glasgow), F.R.F.P. and S.G.; Archibald N. McLellan, M.B. (Glasgow), L.M. (Dublin); Robert A. Lennie, M.B. (Glasgow); John Hewitt, M.B. (Glasgow); 1924. London: Edward Arnold and Company. Royal 8vo., pp. xvi. + 573, with illustrations. Price: 21s. net.

A POCKET BOOK OF OPHTHALMOLOGY, by Arthur James Ballantyne, M.D., F.R.F.P.S. (Glasgow); Second Edition; 1924. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 144. Price: 6s. net.

ANÆSTHESIA FOR NURSES, by Colonel William Webster, D.S.O., M.D., C.M.; 1924. St. Louis. The C. V. Mosby Company. Post 8vo, pp. 153, with illustrations. Price: $2.00 net.

BEZIEHUNGEN DER EKZEMATÖSEN ERKRANKUNGEN ZU INNEREN LEIDEN, von Hofrat Prof. Dr. S. Ehrmann; 1924. Halle a.S.: Carl Marhold Verlagsbuchhandlung. Demy 8vo., pp. 56. Price: 1.50 Marks, equals approximately 1s. 8d.

DER AUSFALL DESKOPFAARS UND SEINE BEHANDLUNG, von Prof. Dr. med. Felix Pinkus; 1924. Halle a.S.: Carl Marhold Verlagsbuchhandlung. Demy 8vo., pp. 65. Price: 2 Marks, equals approximately 2s. 3d.

Medical Appointments.

Dr. E. C. East and Dr. H. H. F. Martell have been appointed Members of the Board of Management of the Fremantle Public Hospital, Western Australia.

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Dr. H. S. Newland (B.M.A.) and Dr. Bronte Smeaton (B.M.A.) have been appointed Members of the Dental Board of South Australia.

* * * *

Dr. Elsie Jean Dalyell (B.M.A.) has been appointed Assistant Microbiologist, Office of the Director-General of Public Health, Sydney.

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Dr. J. Hough has been appointed Acting Resident Medical Officer, Government Hospital, Kalgoorlie, Western Australia.

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Dr. Albert Curtis (B.M.A.) has been appointed Acting Medical Superintendent of the Hospital for the Insane and the Receiving House, Ballarat, Victoria.

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Dr. R. Townsend (B.M.A.) has been appointed a Member of the Council of the Box Hill Technical School, Victoria.

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Dr. Edward Angas Johnson (B.M.A.) has been appointed Deputy Inspector-General of Hospitals, Adelaide.

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Dr. Herbert Champion Hosking (B.M.A.) has been appointed Acting Deputy Superintendent of the Mental Hospital, Adelaide.

Medical Appointments Vacant, etc..

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xiv..

DEPARTMENT OF PUBLIC HEALTH, SYDNEY: Medical Officer to Baby Health Centre.

ROYAL NORTH SHORE HOSPITAL OF SYDNEY: Temporary Honorary Vacancies.

MACKAY DISTRICT HOSPITAL, QUEENSLAND: Resident Medical Officer.

CHARTERS TOWERS HOSPITAL: Resident Medical Superintendent.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C..

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited Mutual National Provident Club. National Provident Association.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Honorary Secretary, 12, North Terrace, Adelaide.	Contract Practice Appointments at Renmark. Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

FEB. 10.—New South Wales Branch, B.M.A.: Ethics Committee.
FEB. 12.—Victorian Branch, B.M.A.: Council.
FEB. 12.—South Australian Branch, B.M.A.: Council.
FEB. 13.—Queensland Branch, B.M.A.: Council.
FEB. 17.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
FEB. 17.—Tasmanian Branch, B.M.A.: Council.
FEB. 17.—Illawarra Suburbs Medical Association, New South Wales.
FEB. 20.—Central Southern Medical Association, New South Wales.
FEB. 24.—New South Wales Branch, B.M.A.: Medical Politics Committee: Organization and Science Committee.
FEB. 25.—Victorian Branch, B.M.A.: Council.
FEB. 25.—Section of Surgery, New South Wales Branch, B.M.A.
FEB. 27.—Queensland Branch, B.M.A.: Council.
MAR. 3.—New South Wales Branch, B.M.A.: Ethics Committee.
MAR. 3.—Tasmanian Branch, B.M.A.: Council.
MAR. 4.—Victorian Branch, B.M.A.: Branch.
MAR. 4.—Section of Obstetrics and Gynæcology, New South Wales Branch, B.M.A.
MAR. 6.—Queensland Branch, B.M.A.: Branch.
MAR. 10.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
MAR. 10.—Tasmanian Branch, B.M.A.: Branch.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, B.M.A. Building, 30-34, Elizabeth Street, Sydney. (Telephone: B. 4635.)

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